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Shears with Two Movable Knives

Steel Mill Unit Designed for Cutting Upward— Clean Cut Ends Among Advantages —Avoids Depressing Table

BY JOHANN HAHN*

SHEARS with movable top and bottom knife, while in use in Europe in a number of different designs, have not, to the knowledge of the writer, been built in the United States. The principal working process is not new, but it has great advantages and may be considered a step ahead in auxiliary machinery for rolling mills. Before explaining the action of "shears with movable top and bottom knife," the usual process of cutting a hot bloom or bar may be considered.

After the bloom has been brought between the knives (Fig. 1) the top knife is lowered and shifts the part of the bloom under it downward a distance a little greater than the height of the bloom. The part of the bloom (at left) in contact with the fixed bottom knife cannot follow this motion. Therefore a separation of the bloom takes place which is called shearing (Fig. 2).

It is obvious that the rollers supporting the downward-moving section of the bloom have to yield to this motion. This has led to the design of the so-called "shear depressing tables." These tables, usually on the delivery side of the shear, are pivoted on or near their end farthest from the shear. The other end, near the shear, is counter-balanced by weights, hydraulic cylinders, etc. At each cut this balanced end of the table tilts down, giving way to the motion of the bloom. Such a shear depressing table is a comparatively complicated device and, due to the rough service to which it is exposed, it is difficult and in certain cases impossible to keep it in good working condition.

Rolling mill men will agree with the writer in saying: "Shear depressing tables are a nuisance and their replacement by stationary roller tables would save much trouble and delay." A shearing process has been developed which makes a stationary table possible, instead of a depressing table. It operates in five phases as follows:

1.—The bloom is brought between the knives and rests on support *A*. (Fig. 3.)

2.—The top knife moves down into contact with the

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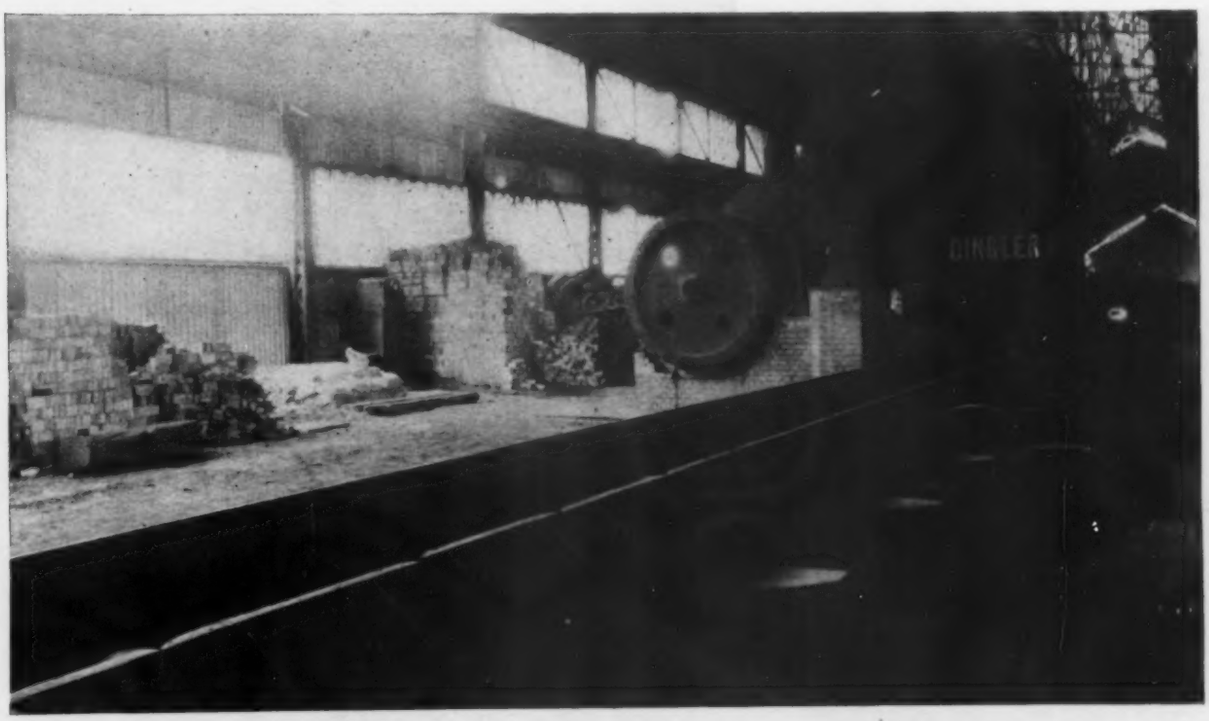


Front of Shear as Installed in a Steel Mill in Europe, Which Embodies the Up-Cutting Feature Brought Out in the Article. This type of shear is said to avoid the bent bloom ends commonly seen

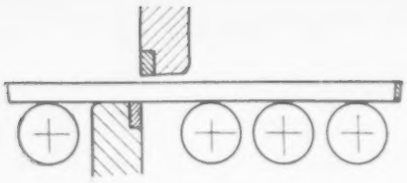


FIG. 1

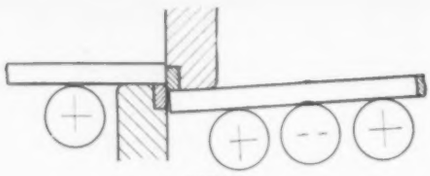


FIG. 2

Fig. 1 Is of the Customary Type of Down-Cutting Shear, Showing the Bloom in Position to Be Cut, But the Knife Still Stationary Above It

Fig. 2 Shows the Cut Made, the Receiving Table Depressed and the Upper Knife Ready for Withdrawal Upward

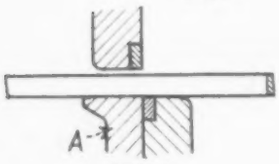


FIG. 3

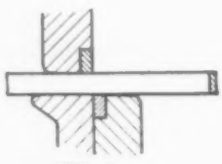


FIG. 4

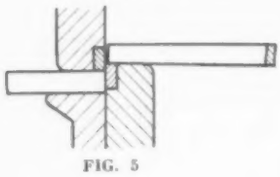


FIG. 5

Fig. 3 Is of a Shear with Stationary Table, the Bloom Resting Between the Knives on Support A

Fig. 4 Is the Same Shear with Upper Knife Brought Into Contact and Pressing the Bloom Firmly on the Support

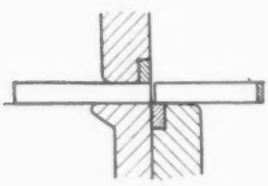


FIG. 6

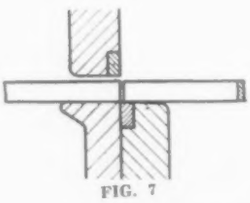
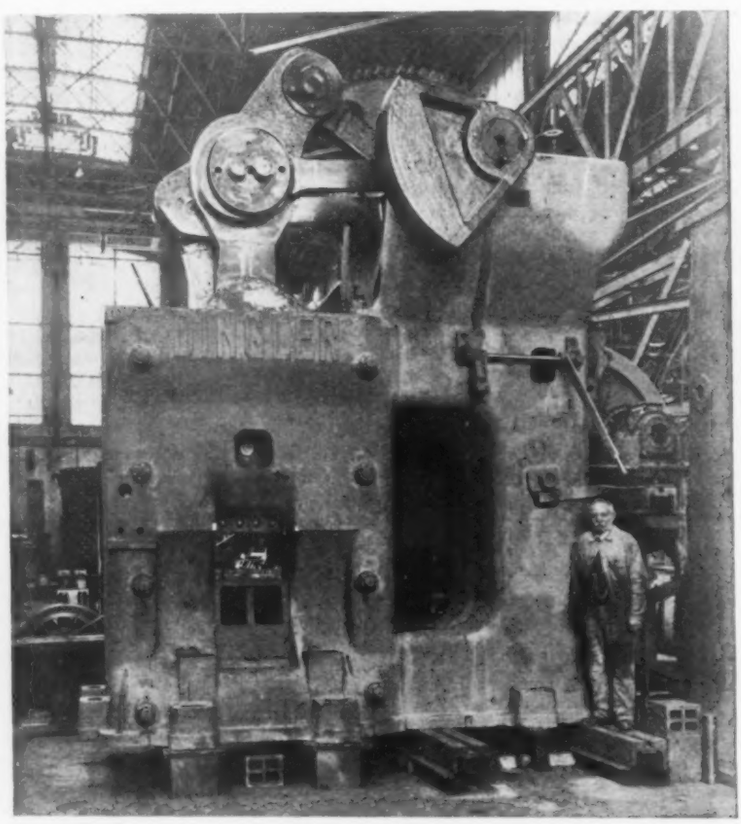


FIG. 7

Fig. 5 Indicates the Way the Cut Is Made by an Upward Stroke of the Lower Knife, While the Bloom Is Gripped Between the Upper Knife and the Support

Fig. 6 Depicts the Situation After the Cut, When the Lower Knife Has Been Withdrawn Fully

Fig. 7 Shows the Upper Knife Removed Upward, Leaving the Severed Bloom Free to Move On for the Next Cut



Erection Photograph of the Shear Shown on Page 1811. One feature stressed is that all parts are easily accessible for inspection and adjustment. This shear is shown in diagram in Figs. 16 and 17

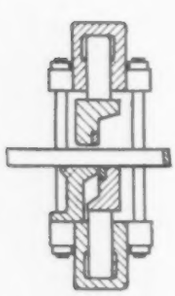


FIG. 8

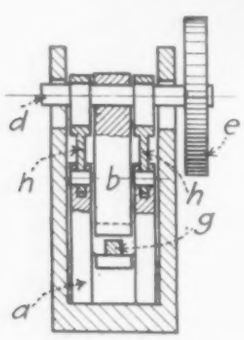


FIG. 9

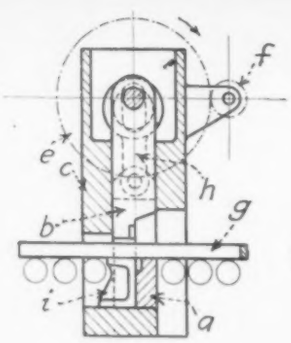


FIG. 10

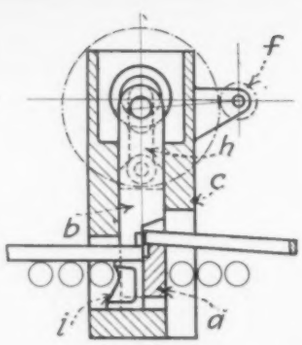


FIG. 11

Fig. 8 Mechanism for Procuring Working Cycle Shown in Figs. 3, 4, 5, 6 and 7. Two hydraulic cylinders, one for each knife, operate them

Fig. 9 End View of a Shear on This Principle, with Successive Positions of Knives Shown in Side Views, Figs. 10 and 11. Bloom G is acted upon by knives carried on knife holders A and B, both of which may slide vertically in frame C. The main gear E, on eccentric shaft D, follows the sliding motion of upper knife carrier B

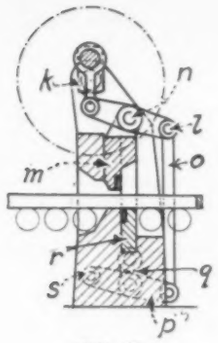


FIG. 12

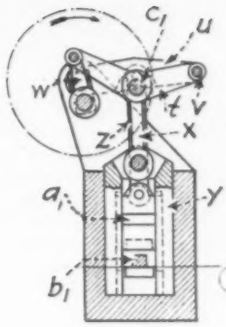


FIG. 13

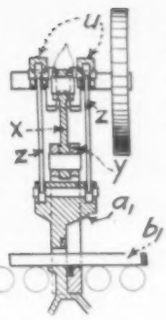


FIG. 14

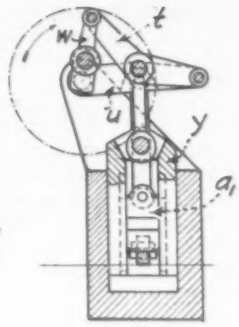


FIG. 15

Fig. 12 is a Shear with the Working Cycle of Figs. 3 to 7, But with Stationary Eccentric Shaft and Main Gear. Several shears of this type have been built in Europe. Figs. 13, 14 and 15 represent a shear with movable knives designed by the author. This shear fulfils the condition of permitting the knives to move up and down while counter-acting

bloom and presses it firmly on the support. (Fig. 4.)

3.—The bottom knife rises, thus cutting the bloom, until its upper edge travels a small distance over the lower edge of the top knife. This distance (the overlapping of knives) should be constant or about constant at different heights of blooms. (Fig. 5.)

4.—The bottom knife descends to its lowest position. (Fig. 6.)

5.—The top knife rises and leaves the bloom free to pass on. (Fig. 7.)

It is obvious that this working cycle can be obtained easily by a hydraulic shear, where top knife and bottom knife are operated by a separate cylinder each. (Fig. 8.) As electric power is preferred to hydraulic power, mechanical shears using electric motors have been designed for this working process. The illustrations show the working principles plainly, in a diagrammatic way.

In each mechanical shear having the above working cycle it must be possible to raise and lower the knives while they are oscillating one against the other. In other words, the knives are free to move up and down while counter-acting. The reader will see that this is the case with each type of shear described hereafter.

On the shear shown in Figs. 9, 10 and 11, bottom knife holder *a* and top knife holder *b* can slide up and down in the shear housing *c*. The eccentric shaft *d*, which carries the main gear *e*, is held in the top knife carrier and follows this sliding motion. The main pinion *f* rests with its shaft in a stationary bearing on the shear housing. The cutting process is as follows:

After the bloom *g* has been entered, the main gear rotates in the direction of the arrow. The eccentric shaft, supported by the two connecting rods, moves down and with it the main gear *e*, the top knife and its carrier *b*. This motion is stopped when the top knife is in firm contact with the bloom and presses it on the support. By continuing the rotation, the eccentrics, by means of rod *h*, raise the bottom knife carrier and bottom knife, which results in severing the bloom, as shown in Fig 11. Then the bottom knife and holder are lowered again until the latter rests on the shear housing, whereupon the eccentric shaft with main gear and top knife holder lift into the initial position, thus leaving the bloom free for moving ahead. This shear has been built a number of times. A disadvantage is that the eccentric shaft and the main drive gear are not stationary, but move up and down at each cut.

The shear shown in Fig 12, patented in the United States, gives the working cycle required above. It has a stationary eccentric shaft or crank shaft and therefore a stationary main gear. Its action is as follows:

The bottom knife rests in the shear housing and holds levers, connecting rods and top knife carrier in place as shown. When the crank *k* rotates (in any direction), the upper lever turns around point *l* and the top knife carrier lowers until it rests on the bloom. Then the lever turns around point *n*, point *l* lifts and by means of rod *o*, lever *p* and link *q*, the bottom knife carrier and bottom knife rise and cut the bloom. Lever *p* is pivoted in the shear housing in point *s*. As the crank continues to turn, the bottom knife carrier lowers until it rests in the shear housing; the point *l* becomes stationary, the top knife lifts off the bloom and allows it to move on. Several shears of this kind have been built in Europe. An advantage of this shear is that it has a stationary crank shaft. A disadvantage is that one lever is below the knives and therefore exposed to scale and water and not readily accessible.

For some time the writer has been facing the problem of designing a shear with movable knives, and has developed a number of improved and new designs. Patent rights in the United States have been obtained. The three principal ones are shown in Fig. 13 to Fig. 19.

Improved Shears with Movable Knives

The shear represented in Figs. 13, 14 and 15 shows two levers *u* and *t*, linked together in point *v*. Lever *u*—for reasons of design, consisting of two parts on either side of the crank—is pivoted on the crankshaft, and lever *t* is connected to the crank pin by rod *w*. By tension rods *x*, lever *t* is connected with the bottom knife carrier *y*, which rests on the shear housing, and by compression rods *z*, the lever *u* is connected with top knife carrier a_1. When the crank turns, the knives

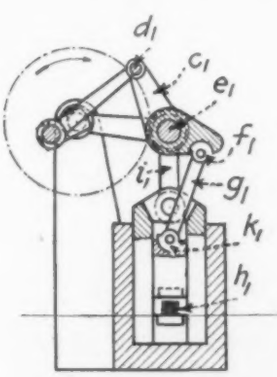


FIG. 16

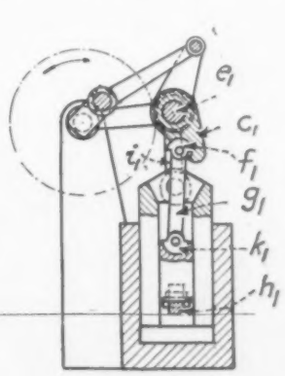


FIG. 17

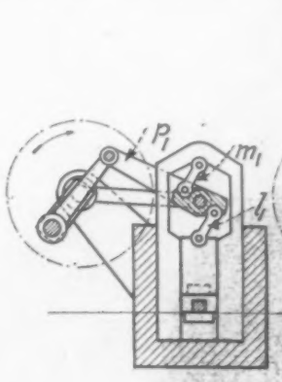


FIG. 18

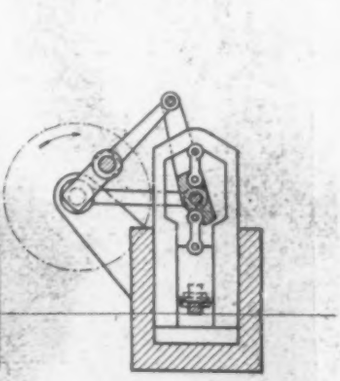


FIG. 19

Simpler Operating Conditions Are Obtained in Two Types of Shear Shown, Respectively, in Figs. 16, 17, 18 and 19. Two shears, built as in Figs. 16 and 17, are at work in a European steel plant. The design of Figs. 18 and 19 is an improvement in detail, resulting in what the author considers "the simplest and best design of a shear of this type"

oscillate against each other, and at the same time point v and consequently the knives may be raised and lowered. This means that the shear answers the above-given condition: the knives are free to move up and down, while counter-acting. In detail the working cycle of this shear is as follows:

Before the cut its position is as shown in Figs. 13 and 14. The knives are open, bottom knife carrier y resting on the shear housing, supported by means of the lever system. Bloom b_1 is entered and the main drive gear rotated in the direction of the arrow. Lever t rocks around point c_1, point v lowers and with it lever u, rods z, top knife carrier a_1, and the top knife until the latter is in firm contact with the bloom (and presses it on its support). This stops the downward motion of point v. Further turning of the crank causes the rising of point c_1, rod x, the bottom knife carrier and the bottom knife. The latter thus effects the cutting of the bloom, Fig. 15. The crank has made about one-half turn. In the other half the bottom knife descends to its lowest position, the top knife lifts and brings the shear back to its initial position, Fig. 13.

Although this shear answers all conditions regarding working cycle and accessibility of the parts, the writer has been able to find more simplified designs which apply only one lever instead of two.

One-Lever Shears

Fig. 16 and Fig. 17 show one type. Lever c_1 is linked in point d_1 to the crank pin; in point f_1 to the top knife carrier; in point e_1 to the crank shaft and the bottom knife carrier. When the crank turns in the direction shown, the lever c_1 rocks around point e_1. Point f_1, compression rod g_1, top knife carrier and top knife lower until the contact between the latter and the bloom h_1 stops this motion. Then, as the crank turns further, point e_1 rises and with it tension rod i_1 the bottom knife carrier and the bottom knife. This performs the cutting of the bloom. The position at the end of the cut is shown in Fig. 17. It will be noticed that in this figure the points e_1, f_1 and k_1 are about in a straight line. This is necessary, to obtain about the same overlapping of the knife edges at the end of the cut for any height of bloom.

During the second half revolution of the crank the motion of the knives is reversed; the bottom knife lowers and the top knife lifts, thus completing the working cycle.

Two shears of this type, designed by the writer, have been built for a European steel plant and are working satisfactorily. Photographs of one of them, at erection and after installation, are shown. Besides giving the desired working process these shears, Figs. 16 and 17, are simple in principle and have all parts easily accessible. Nevertheless, a number of difficulties had to be overcome in their construction; for instance, the arrangement of a tension rod i_1 on either side of the lever, so that the compression rod g_1 could swing in between them. This led the writer to the arrangement shown in Figs. 18 and 19.

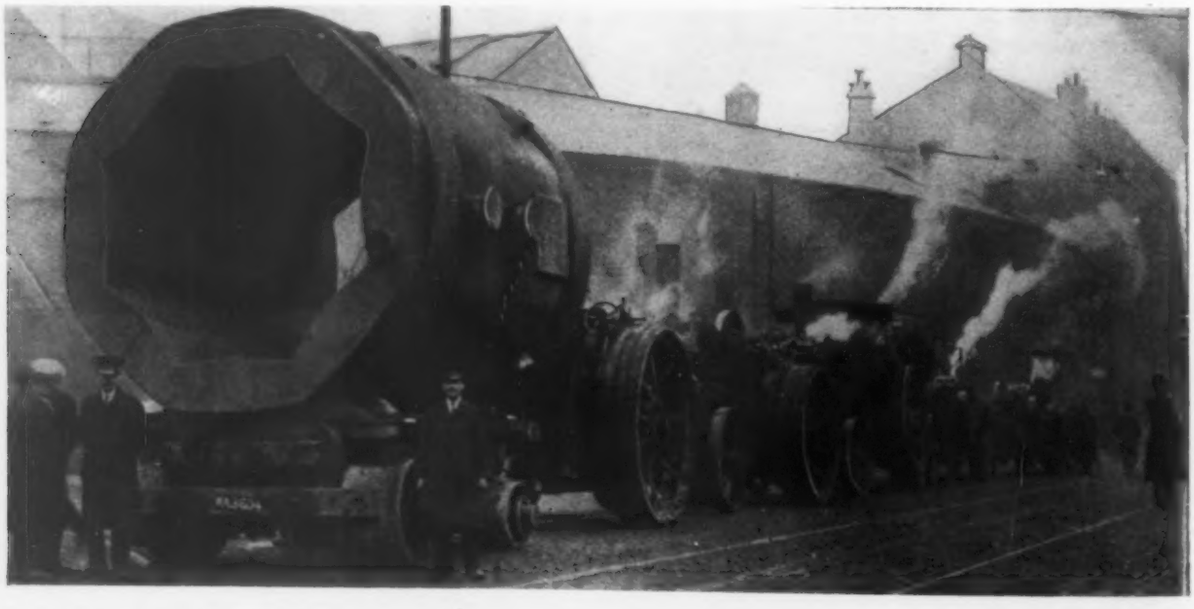
It is in principle the same as shown in the two preceding figures, only that tension rods i_1 (Figs. 16 and 17), are replaced by a compression rod. Therefore the bottom knife carrier has been extended upwardly, the lever p_1 brought in the space above the top knife carrier and the compression rods l_1 and m_1 transmit the shearing forces to the top and bottom knife carriers respectively. This arrangement makes it possible to place compression rods l_1 and m_1 in one plane with lever p_1, which is the most desirable condition for the transmission of the shearing forces. The working process of this latest type of one-lever shear may be readily seen by following up one turn of the crank. In my opinion this is the simplest and best design of a shear of this type.

An important feature of the above described "up-cutting shears" should not be left unmentioned. It is generally known that in ordinary bloom shears the bloom ends are more or less bent by the cut, which is often disagreeable and hard to remedy. On the "up-cutting shears" (especially those of Figs. 13 to 19) the top knife, holding one end of the bloom down on the support with a heavy pressure, prevents it from bending and at the same time effects a straight cut. In addition, this design makes it possible to replace the shear-depressing tables by stationary tables. The Mackintosh-Hemphill Co., Pittsburgh, has acquired the United States patent rights for this type of shear.

Large Ingot Mold Cast in England

IN the illustration is shown an unusually large octagonal fluted ingot mold made by the Brightside Foundry & Engineering Co., Ltd., Sheffield, England. The photograph was received from John Shaw of that company, who was one of the visiting foundrymen at the thirtieth annual convention of the American Foundrymen's Association held September last in Detroit.

This mold is designed to take an ingot weighing 110 gross tons and measuring 12 ft. 11 in. long, 7 ft. 7 in. across the flutes and 8 ft. 7 in. across the corners. The mold was cast in 5 min., and the metal had settled down 2½ hr. later.



Fixing Costs for Gray Iron Castings

Comparison of Figuring Methods of Five Foundries —Derivation of Estimating Formula for Pricing

BY H. P. PARROCK*

IN the first section of this article, published at page 1681 in our issue of Dec. 16, the elements of cost in a jobbing foundry were analyzed, with regard to varying production. This concluding section compares five foundries of different characteristics and locations and derives estimating formulas.

Fig. 2 shows the high and low costs of five foundries combined, including that of the present analysis, the curves being extended to correspond to a molder-day of 1000 lb. While the light foundries would have only occasional jobs which would run at the latter speed, the heavy shops would approach this output regularly. The curves are based on the estimating formulas in use in the various shops and on the ratio for labor and material used in the examples given below. The features which distinguish one foundry from the other are briefly as follows:

Foundry A.—That of the analysis; a light to medium shop in eastern Massachusetts. Sand blasts practically all its castings; delivers within a 25-mile radius by a regulated trucking service. Yearly output rating, 6000 tons.

Foundry B.—A heavy foundry in eastern Ohio making rolling mill and steel-plant castings, and heavy mill machinery on contract—shears, rolling mills, lathes, etc. It makes many heavy castings in the floor, does not sand blast, and does not make any deliveries except for local carload lots. It adheres closely to its established line of work and refuses light and complicated work. Yearly output, about 7500 tons.

Foundry C.—A light to medium shop in the Boston area. Sand blasts practically all work, delivers about 25 per cent of its product. Yearly rating, 7500 tons.

Foundry D.—A medium to heavy foundry in western New York. It makes a miscellaneous line of castings, has a small sand-blast equipment for "special" work, but brushes most of its product. It makes local and freight house deliveries only. Yearly rating, 5000 tons.

Foundry E.—A light to medium fast-working shop in western New York. It sand blasts or tumbles all castings at customers' option, work permitting, and makes local and freight house deliveries. It is strictly a piece-work shop. Yearly output, 7500 tons.

Table VI shows the estimated cost figures of these foundries, based on formulas which follow. Sale prices are not compared, because the profits are not regulated to any plan such as that proposed in the analysis of Foundry A. The table furnishes the points on the curves in Fig. 2. The following are the formulas in use, "Direct Labor" meaning molder core-maker labor:

Foundry A.

Metal in ladle (see above) taken here for 50 per cent yield. Molding expense (see above): molding labor times a varying factor, extended beyond 500 lb. per molder-day proportionately.

Core-making expense: core-making labor times	2½
Cleaning expense: cleaning labor times	2¼

Foundry B.

Metal in ladle	1.50c.
Expense: direct labor times	2½

Foundry C.

Metal in ladle and cleaning	2.50c.
Molding expense: molding labor times	1⅞
Core-making expense: core-making labor times	2½

Foundry D.

Metal in ladle	1.60c.
Molding expense: molding labor times	2½
Core-making expense: core-making labor times	3

Foundry E.

Metal in ladle and cleaning	2.40c.
Molding expense: molding labor times	2
Core-making expense: core-making labor times	3

In this table it is assumed that the work calls for one core-maker for four molders, although the class of work actually made demands other proportions, particularly in the case of Foundry B.

Estimated costs approach a common figure at about 500 lb. per molder-day. Foundries A and E begin to go out of their field at about 500 lb. per molder-day, except as they may get this production from medium-sized molding machines. Foundry B, on strictly heavy castings made by hand, can underbid them on this class of work, but not on molding machine work of equal production.

Foundries B and D begin to reach their field at 500 lb. per molder-day; they generally avoid low-speed,

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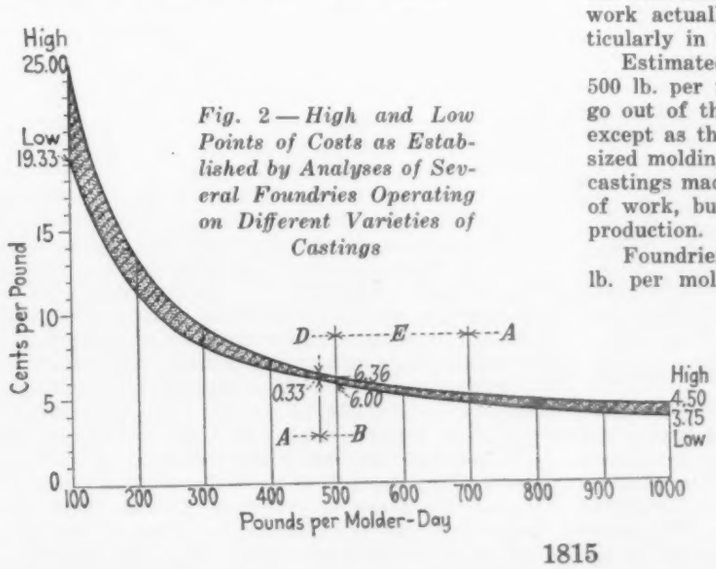


Fig. 2—High and Low Points of Costs as Established by Analyses of Several Foundries Operating on Different Varieties of Castings

Taking the costs as a whole, the different cases examined came nearest to uniformity at an output of about 470 lb. per molder per day

light work. Foundry C uses a consistent simple formula, suitable to its trade. Foundry A is low up to 500 lb. and high from 700 lb. up. It is believed to use a formula consistent with the demands of its market (Boston), its delivery service and its implied range of work—light to medium weight castings of good quality.

There appears to be a marked difference of opinion as to the margin of profit: or rather, the local markets

Table VI.—Comparison of Estimated Costs, Cents per Pound

Foundry	A	B	C	D	E	Maximum Variation, c.
100 lb. per mold day, c.	19.33	24.00	20.50	25.00	22.20	5.67 A-D
200 lb. per mold day, c.	10.95	12.75	11.50	13.40	12.30	2.45 A-D
300 lb. per mold day, c.	8.23	9.00	8.50	9.40	9.00	1.17 A-D
400 lb. per mold day, c.	6.90	7.12	7.00	7.45	7.35	0.55 A-D
500 lb. per mold day, c.	6.09	6.00	6.10	6.28	6.36	0.36 B-E
600 lb. per mold day, c.	5.56	5.25	5.50	5.50	5.70	0.45 B-E
700 lb. per mold day, c.	5.19	4.70	5.07	4.94	5.23	0.49 B-A
800 lb. per mold day, c.	4.87	4.31	4.75	4.52	4.88	0.57 B-A
900 lb. per mold day, c.	4.65	4.00	4.50	4.20	4.60	0.65 B-A
1000 lb. per mold day, c.	4.50	3.75	4.30	3.94	4.38	0.75 B-A

permit a wide range on this item. Foundry B, working usually at about 1000 lb. per molder-day, with an actual cost more nearly 3.50c. than the 3.75c. of its estimating formula (which is based on more core-making than actually required) regularly adds 0.50c. to its cost estimates to obtain the sale price—amounting to 14.3 per cent of the average cost.

In another market, Foundry E adds 10 per cent of its costs in regular procedures. Both these shops, in bad times, are obliged to modify their ideas of profits, though neither of them will make castings below estimated cost, except when they may have made errors, or have been caught in the labor or material markets, as during 1920. On the whole, they are both very successful. Their profit, as used in their estimates, exceeds that required to make adequate return on invested capital. They estimate very accurately, and in so doing are able to satisfy their customers in respect to price, as in quality and service.

Conclusions

It is our opinion that a few comprehensive statements are warranted by this analysis.

1. The multiplying factor used in determining general expense (not including melting expense) is a variable, not a constant factor. It increases as the pounds per molder-day increase; it is not the same for all foundries.

2. It is a safer plan, a more accurate procedure, to use three factors—molding, core-making and cleaning—in determining general expense.

3. Melting expense varies for any given melting equipment—increasing as pounds per molder-day, and yield in per cent of metal poured, decrease. Metal in ladle is not a fixed figure for any prevailing prices of labor and material.

4. Profit in per cent of cost, or sale price, sufficient to provide adequate return on investment is a variable. It increases as the pounds per molder-day decrease.

5. For any jobbing foundry, the cost increases rapidly as the pounds per molder-day fall below 500 lb. The increase in cost, Foundry A, from 500 lb. to 300 lb. per molder-day is 35 per cent; from 300 lb. to 100 lb., 135 per cent. Figs. 1 and 2 illustrate this fact.

6. The variation between all the formulas amounts to:

At 100 lb. per molder-day 29.3 per cent maximum.

At 500 lb. per molder-day 6.0 per cent maximum.

At 1000 lb. per molder-day 20.0 per cent maximum.

This appears to mean two things—

(a) The intention to exclude either very light or very heavy work, for several reasons—local markets, equipment, labor and so on: or

(b) Failure to appreciate the value of all business within the limits of the investment.

7. Strict adherence to any rigid formula (accuracy in appraising production is assumed) finally results in a settled line of work. In a limited market this means a limited available tonnage. A flexible formula, or one having a varying ratio, widens the market. Or, greater division of cost, as in estimating metal in ladle, molding, core-making, cleaning—or going even further, if necessary—results in increased accuracy.

By-Product Coke Near Daily Record in November

Production of by-product coke in November declined 69,000 net tons when compared with October, according to the Bureau of Mines. The decrease was due to the shorter month, for the daily rate of output rose from 122,975 to 124,743 tons, with one exception the highest daily rate on record. The total production for November amounted to 3,743,000 tons, compared with 3,812,000 tons in October. There were 76 active plants, the same number as in October, and these plants produced about 92 per cent of their capacity.

Output of beehive coke during November remained practically stationary, there being a decrease of 8000 tons, or less than 1 per cent, when compared with the preceding month. Production of all coke totaled 4,602,000 tons, the by-product plant contributing 81 per cent, and the beehive plants 19 per cent.

Canadian Wire Manufacturer Expands

The Frost Steel & Wire Co., Ltd., Hamilton, Ont., maker of wire, wire fencing and kindred products, has purchased the property formerly used by the Petrie Mfg. Co. on the Canadian National Railways and Lottridge Street from the R. A. Lister Co., Ltd., and will immediately adapt the buildings to its use. The property bought comprises eight acres of land, on which are located a standard factory-type building and a reinforced concrete office building, which provides ample space to house the staffs of both the Frost company and its subsidiary, the Peerless Wire Fence Co. Among the installations for wire and fence manufacturing to be made on the new property is a large furnace and kettle, which will be used to give steel fencing a heavy coating of pure zinc after it is fabricated. The plant will be in operation shortly after the first of the year.

October Immigration at Rate of Over 400,000 Yearly

In October a total of 56,587 people entered the United States, of which number 34,526 were immigrants or new arrivals for permanent residence in this country, says the Bureau of Immigration. During the same month 19,180 aliens departed from the United States, but only 5377 of these were residents of this country leaving for a permanent stay abroad.

Immigrants in October included 269 iron and steel workers, 50 metal workers and 203 machinists. From July to October the number of steel workers admitted was 675; metal workers, 191, and machinists, 685. In October eight iron and steel workers, eight metal workers and 24 machinists left the United States; while during the period from July to October the number of departing iron and steel workers was 62, metal workers, 17, and machinists, 205.

Will Labor Aid in Management?

Federation Officer Urges That Worker Have the Chance of "Creative Expression"—How Unions and Industrial Leaders Can Cooperate in "Improvement of the Job"

APPRENTICE education and the further self-development of the worker through the opportunity for creative expression in his work—in both of which the need for cooperation of management with trade unions was stressed—were dealt with by Matthew Woll, president of the International Photo-Engravers Union and a vice-president of the American Federation of Labor, in a paper prepared for the annual meeting of the American Society of Mechanical Engineers, held in New York, Dec. 6 to 9.

Because of Mr. Woll's absence his paper, on "Educational Training for Industry," was presented in brief by R. L. Sackett, dean of the school of engineering, Pennsylvania State College, chairman of the session, which was held Dec. 8 under the auspices of the society's committee on education and training for the industries. E. F. DuBrul, general manager of the National Machine Tool Builders' Association, Cincinnati; Luther D. Burlingame, industrial superintendent of the Brown & Sharpe Mfg. Co., Providence; and R. E. Newcomb, superintendent of the Deane works of the Worthington Pump & Machinery Corporation, Holyoke, Mass., were among those discussing the paper.

"Organized labor's interest in education for industry is rooted in one of its most fundamental purposes, the conservation of craftsmanship," said Mr. Woll. "It is this idea which underlies the whole structure of American unionism. Bricklayers, machinists, electricians, printing pressmen are on a trade basis; it is their common craft interest which binds them together."

Workman's Urgent Need for Creative Expression

Creative expression in work was held to be a strong motive with all men who do work of any kind, and a chance to use one's intelligence to develop an ever-greater excellence of workmanship was stressed as redeeming work from pure drudgery. "In the workman's nearness to drudgery, the need for creative expression is very urgent," said Mr. Woll.

"To fill this need the men naturally turn to their union, since it is the embodiment of their common craft interest," he continued. "The union, which is the custodian of trade skill and past experiences, becomes their means of contact with an agency which makes possible sustained development of craftsmanship. Through magazine articles, lectures by experts and workers' education classes the unions are keeping their members abreast of the latest craft developments, new inventions and trade processes, information on industrial problems, which will enable them to apply their minds effectively to their jobs. Further than this, the union maintains standards of craftsmanship for the admission of new members. It also takes the responsibility of disciplining those who do not maintain a high quality of workmanship. This goes even to the point of expelling members who do not live up to union standards. Thus it has come about that the union sets and holds standards of craftsmanship in an industry. It is the only standard-setting agency in the industrial field which exercises this function."

Technical knowledge of the trade, held to be necessary for the boy who wants to be a carpenter, machinist, etc., should, it was said, include mathematics, architecture, physics, English and other subjects which will contribute to a true understanding and mastery of his craft. It includes also a thorough knowledge of trade processes. The apprentice must also have trade experience under expert guidance and he must know the economic and business problems of his trade. This trade education, when carried on through public schools, should be under the joint control of employers, the unions and the public school, said Mr. Woll. The special contribution made by each group was outlined in the paper, and it was stated that no one group without the others could give a fully rounded education.

Creative Expression Attained Through Job Improvement

"When the worker has had this first preparation, he is ready for the second part of his education, that which goes on continually through his daily work," said Mr. Woll. "The development of skill in work grows out of the work itself. It is a process by which the worker masters the job details, gains understanding of its problems, and finally reaches the point where he turns his energies to improving the job itself. It is this latter—the improvement of the job—which gives him scope for continued self-education and development for creative expression in work.

"To provide conditions such that this creative expression through job improvement can go on and can be the means for increasing industrial efficiency is by no means an impossible task. The average workman develops a technical knowledge of his job and thinks of ways his work might be better done, waste eliminated and time and energy saved. Because of his intimate contact with job details and his specialized knowledge he can suggest improvements which are outside the experience of management and so make a specialized contribution. When he has no channels through which to voice his ideas they are lost to industry. But if the means can be found to make these ideals available for practical use, a working force of men intent upon increasing efficiency can be developed and a chance for all to find creative expression in their work will be provided.

Workers Interested in Increased Production

"This means must come through cooperation between management and men to increase production efficiency. The welfare of the industry is a real interest with the workers. Their livelihood depends upon it, and the means for increasing their wages must come from its prosperity and efficiency. Therefore it can well be the basis of cooperation between the two groups, bringing them together in the common work of industrial improvement. But in order that workers may join with management in wholehearted cooperation, certain conditions are necessary. They must have confidence and they must feel responsible for their share in the common enterprise; they must know that management will give them a chance to put ideas into practice when they are worth while, since management is the controlling force. Especially they must know that when profits result from their efforts they will receive their full share. Only under such conditions can the workers' full mental energy be liberated for their work.

"This condition can be brought about through the trade union. The union is the agency for mobilizing the human factor in industry. Through it progress in human engineering can keep pace with progress in the mechanical sciences. It is the organization which has the men's complete confidence; it calls out their initiative, enables them to take responsibility and to discipline their own members; it provides the machinery necessary for contact between management and the individual men. And, above all, it trains leaders—men with the initiative and intelligence that come from working out their own problems; and with the understanding of industry and the knowledge of human nature that come from guiding their fellows through the human difficulties that continually arise in their daily work. The unions are ready to cooperate with management in the task of raising industry to the highest possible degree of efficiency."

Some industries in which trade unionists are now cooperating were mentioned, one of them being the re-

pair shops of the B. & O. Railroad, in which joint shop committees and union representatives meet every two weeks to discuss production efficiency. It was said that in the last three years over 14,000 suggestions for improvements were submitted by the workmen, 80 per cent of these suggestions being accepted.

"This chance for intellectual expression in work is the logical next step in industrial progress," said Mr. Woll in concluding his paper. It provides for continued improvement in efficiency without making the individual worker a mere cog in the industrial machine. It makes full use of the human qualities that are now so often wasted, and at the same time gives the worker a chance to employ creative expression in his work. Such a condition is a fitting goal for education in modern industry."

Union Practice Not in Line with Mr. Woll's Proposal

All labor unions do not practice the very excellent principles set forth in Mr. Woll's paper, it was pointed out by E. F. DuBrul in discussing it. "Good management," he said, "is glad to learn from forward-looking union leaders that the unions are ready to cooperate in the task of raising industry to the highest possible degree of efficiency. I am perfectly willing to believe that the paper expresses the sentiments of the select few—the best informed, and the clearest thinking among union leaders. But the practice of the many, who are ill informed, and whose thought processes are far from logical, does not as yet conform to these principles to such a degree as seems to be taken for granted by Mr. Woll.

"Much remains to be done by forward-looking union leaders to win the rank and file, and especially the officials of local unions, to that same way of thinking. Forward-looking management will not disparage the difficulty that these leaders will have to overcome in bringing about this result. In doing so, however, it is not well to idealize the union nor to think it is now doing all that one hopes it may do at some distant date. If the author of the paper had made it plain that he has expressed ideals rather than quite exceptional realities, his paper would have a more constructive effect than it can have in its present form before the present audience."

"Some of the author's statements take in too much territory and are too sweeping in their generalizations," said Mr. DuBrul in another part of his comment. "For example, he states that all workmen feel an urgent need for creative expression. Now it is a stubborn fact that this is not the case. He then says that to fill this need the men naturally turn to their union. This is true, of course, in some cases, but having known many cases in which union membership was held merely because the workmen were coerced into doing so, many of us know that the realities are far from the author's idealizations."

Responsibility of Management Cannot Be Transferred

"Mr. Woll says: 'The union sets and holds standards of craftsmanship in an industry.' Also: 'It takes the responsibility of disciplining those who do not maintain a high quality of workmanship.' If this expresses a belief that unions generally set worthy standards of craftsmanship, numbers of experts in management are in a position to disillusion the author. No competent manager would be willing to transfer the disciplinary responsibility for slack workmanship to a union. Experience shows that that is a responsibility of management that cannot be transferred successfully.

"The author is in grave error in making the broad statement that the union is the only agency in the industrial field exercising the standard-setting function in respect to craftsmanship. Any experienced manager can show many cases to the contrary. In fact, it would be a quite exceptional union that could function as the only agency in a very narrow industrial field for setting standards of craftsmanship that can reasonably be exacted. If the author's statement were true even to a very limited extent it is not likely that industrial engineer's production men, rate setters, time-study men, inspectors and all such personnel would be drawing the pay that tight-fisted controllers of industry deem it advisable to hand over to them."

In referring to the example of union and management cooperation in the Baltimore & Ohio repair shops Mr. DuBrul said:

"If the author were better informed as to the conditions in the B. & O. Railroad shops that existed prior to the B. & O. machinist union's agreement for cooperation, he would not cite this as a convincing proof of the reality of his idealizations. He accepts what others have said, but without analyzing their statements. To get an idea of what the B. & O. shop management was before the agreement one need only read statements made in addresses by officials of the machinists' union. These disclose conditions to have been so exceedingly inefficient that even union management showed an improvement over the previous management. But that is no proof that the same sort of improvement would follow by turning over to the same union the management of better run shops."

Further Effort to Correct Trade Abuses and Unethical Practices

To correct trade abuses and unethical practices in relations among manufacturers, wholesalers, and retailers, inter-group committees are being organized by the Chamber of Commerce of the United States. A tentative manual describing in detail the organization and functions of these joint trade relations committees is in preparation as a guide for trade groups contemplating their formation.

Some of the practices to be dealt with by the committees are: Unjust return of merchandise, failures to deliver at appointed time, misrepresentation of merchandise by salesmen, unreasonable cancellations, disregard of shipping instructions, failures to confirm orders, salesmen promising things employers cannot fulfill, selling competitors when line is stated to be exclusive, taking discounts not earned, and delivering more than was ordered. The natural development of the work of a joint trade relations committee is outlined as "(1) collection of instances of such trade abuses, (2) development of code of standard practice, (3) correction of violations of approved trade practices through correspondence with those who are stated to have made the violations."

A joint committee has been formed in the hardware trade.

To Operate Bayonne Bolt & Nut Works Independently

The Bayonne Bolt Corporation, Second Street and Trask Avenue, Bayonne, N. J., has been formed to purchase and take over the operation of the Bayonne Bolt & Nut Works, formerly operated by the receivers of the Hoopes & Townsend Corporation and prior to that by the American Bolt Corporation. Effective Dec. 22, the new corporation will conduct all business of the Bayonne works without ties or connections with any other concern, adhering to the manufacture of the same line of products as in the past.

J. Rich Steers, chairman of the new corporation, was president of the original Bayonne Bolt & Nut Works from 1914 to 1923. E. L. Rupf, the new president and treasurer, was plant manager of the old company during the same period, and Arthur D. Morris, the new vice-president, was manager of sales, continuing in that capacity during the recent period of receivership. W. H. Ackerman is secretary of the new company and James H. Berry, assistant treasurer.

Total apparent consumption of Babbitt metal in November, based on reports received by the Department of Commerce from 27 firms, was 4,358,127 lb., compared with 4,868,053 lb. in October.

BOOK REVIEWS

Profits. By William Trufant Foster and Waddill Catchings. Pages, 465. Published by Houghton, Mifflin & Co., Boston, for the Pollak Foundation for Economic Research. Price, $4.

For the best adverse comment on this book $5,000 is to be awarded. We are not competing in this contest, although its terms are very fair. The authors expose themselves to criticism, however, and will no doubt get it, and there will be ample opportunity for the prize-winning essayist.

The first half of the book, dealing especially with the subject of profits is very good, very sound and very lucid. The authors have an engaging style and are rich in illustrations, analogies and imageries. So many of these are purely American that they are likely to be as meaningless to foreigners as is our slang. Indeed, it is to be feared that our own Middle West will not always be discerning and appreciative.

In this part of their book the authors reveal some inconsistencies and even contradictions, but on the whole the development of their thesis is characterized by unusual intelligence and common sense. The case that they make for the legitimacy of profits and the naturalness of markets ought to shatter the belief of many socialistic thinkers that such things are determined daily and arbitrarily in a council at the corner of Wall and Broad Streets.

With the second part of this book we quickly became impatient, saturated as it is with a queer idea in respect to money, an idea that is like Henry Ford's, but quite shocking to orthodox economists. The authors' argument is summarized in the following:

"Progress toward greater total production is retarded because consumer buying does not keep pace with production. Consumer buying lags behind because industry does not disburse to consumers enough money to buy the goods produced; and because consumers, under the necessity of saving, cannot spend even as much money as they receive. There is not an even flow of money from producer to consumer, and from consumer back to producer. . . . Inadequacy of consumer income is, therefore, the main reason why we do not long continue to produce the wealth which natural resources, capital facilities, improvements in the arts, and the self-interest of employers and employees would otherwise enable us to produce. Chiefly because of shortage of consumer demand, both capital and labor restrict output, and nations engage in those struggles for outside markets and spheres of commercial influence which are the chief causes of war."

The authors do not, therefore, look upon money as a medium of exchange, but rather revert to the old adage that it is what makes the mare go. If a corporation fails to distribute all of its earnings in dividends it checks the flow, impounding more or less of this thing called money; but how any corporation or anybody else can do any such thing is not explained by the authors. If the surplus earnings of a corporation are distributed as dividends the stockholders spend them for the things they want. If they are retained by the corporation they are spent for the things it wants. Either way, they are spent for goods and services. What else can be done with them? One party may demand one sort of goods and the other party another, and diversion of the buying power may unbalance previous market conditions, but the aggregate of demand is not checked. That results from other things, especially a contraction of surplus of earnings.

These authors are confused in their understandings of wealth, capital, credit and money. They arrive at such preposterous absurdities as decrying thrift and upholding warfare as an economic beneficence. What they are really preaching is the merit of a consuming economy as against a capital economy looking forward to the future. We shall leave it to the winner of the $5,000 prize to expose in detail the many fallacies that obsess them.

W. R. INGALLS.

Diesel Engines; Marine—Locomotive—Stationary. By David Louis Jones. Pages 565, 6 x 9 in., 341 illustrations. New York: Norman W. Henley Publishing Co., 2 West Forty-fifth Street. Price $5 net.

Written by a practical engineer who is a commissioned chief machinist, United States Navy, and is instructor in the Diesel engine department of the Navy Submarine School, New London, Conn., this book is described as "a practical treatise on the principles, construction, operation and maintenance of the Diesel oil engine." As it is intended for the use of the operating engineer, it explains in simple terms the underlying principles of thermodynamics and the principles of operation of all types of engines. The constructional features of the engines and such auxiliaries as fuel pumps, injection valves, starting and reversing systems, air compressors, governors, etc., are all treated in detail. Instructions are given, not only for the operation and maintenance of Diesel engines, but also for their installation.

A Diesel engine is described as "an internal combustion engine actuated by the gases resulting from the combustion of a liquid fuel injected in a fine state of subdivision into the engine cylinder at or about the conclusion of the compression stroke. The heat resulting from the compression of air to a high temperature is the sole means of igniting the charge of fuel. The combustion proceeds at, or approximately at, constant pressure."

Engines of as large as 16,000 brake hp. are being built for marine use. In the last five years the number of motorships has been almost trebled, and the world's motorship construction has grown to about 60 per cent of the construction of steamships. Locomotives with Diesel engines are now being operated in competition with steam locomotives, and at a cost which is stated to be much lower. In view of these facts, the importance of the Diesel engine cannot be overestimated.

Seventeen chapters, in addition to the introduction, are devoted to the various elements of the engine, its operation and care, and the particular uses which it has attained in special fields.

Representative types of engines, practically all of them for stationary or land use, are covered in one chapter which occupies more than one-fourth the total bulk of the book. Fourteen different makes of engines are here described, some of the makers being represented by two or more types of engine. The illustrations throughout are largely line cuts, descriptive of special features brought out in the text. Halftones are numerous, however, both in illustrating complete engines and with regard to parts or partial assemblies.

Foreign Commerce in the Fiscal Year

In the annual report of the Bureau of Foreign and Domestic Commerce for the year ended June 30 last, it is pointed out that aggregate exports from the United States during the fiscal year amounted to $4,754,000,000, compared with $3,771,000,000 in the fiscal year, 1922, and an average of $2,166,000,000 in the five immediate pre-war years. The increase over 1922 was thus 26 per cent "and no part of this was due to the advance in prices. After allowing for the diminished buying power of the dollar the increase over pre-war was in the neighborhood of 35 per cent.

"Our imports have gained even more. They amounted in 1925-26 to $4,467,000,000, a figure somewhat swollen by the excessive price of rubber. This total was 71 per cent more than four years before. Adjusted for the change in the price level, imports of last year were 65 or 70 per cent greater than before the war.

"Notwithstanding the fact that the United States has shifted from a debtor nation to the world's greatest creditor nation, toward which imports tend to flow in payment of interest on a vast volume of foreign invest-

ments, our exports have continued to exceed our imports by a large margin."

Services Rendered by the Bureau

Trade-promotive services rendered to American firms during the year amounted in number to 1,768,808. 428,069 trade opportunities and 578,452 trade lists were distributed by the district or domestic branch offices, while 58,553 visitors applied for assistance in handling export trade problems. Comparative statements in tabular form of the commercial services rendered in the five most recent fiscal years, shows how various commodities enter into this sort of service.

Catalog Describing Industrial Ovens

Industrial ovens for japanning, enameling, lacquering, core baking, low-temperature heat treating and other manufacturing processes requiring temperatures up to 900 deg. Fahr., are described and illustrated in a new catalog of the Gehnrich Indirect Heat Oven Co., Inc., Long Island City, N. Y.

The catalog is made up of 50 pages, 8½ x 11 in., and is bound in loose-leaf form, with an unusually attractive embossed two-color cover. It is in four sections, dealing with construction features of the company's ovens, gas ovens, electric ovens and methods of loading respectively. Each section ends with a page carrying a large number of trademarks of well-known users of the company's equipment.

In the first section, dealing with construction features, data is given on the oven walls, roof and corner sections, insulation and other details. The section devoted to gas ovens pictures the method of assembly and includes descriptive data and tables of dimensions of indirect recuperative and indirect full heating chamber units. Closet model and standard wall types are described in the electric oven section, dimensions for all sizes being given. The concluding section, 24 pages, deals with methods of loading, which are shown for the most part by illustrations. Pages are also devoted to oven trucks and trays.

The Citizen and the Constitution, a book by Thomas Dillon O'Brien, (Pages 177, 5 x 8 in. Published by the Universal Knowledge Foundation, New York. Price, $1.50.) is the best exposition of our Constitution that your reviewer has seen. It is especially interesting in that it contains many things that even the average American does not know, or at least remember. Judge O'Brien points out that at one time there was a claim that a corporation charter, being a contract, could not be revoked by any State; but this was held to be unconstitutional; that no corporation can be compelled to perform its duties at a loss; and that arbitrary power and class rule (by either labor or capital) are one and the same thing. The full text of our Constitution with its various amendments is given in an appendix.

The products of some 500 manufacturers are briefly described and illustrated in the sixteenth annual, 1926-27, volume of "Condensed Catalogs of Mechanical Equipment," which has been published by the American Society of Mechanical Engineers, 29 West Thirty-ninth Street, New York. The catalog has 910 pages, 8½ x 11 in., and is made up of three main sections: Classified catalog section; general classified directory of manufacturers in the mechanical field, and professional engineering service directory. The price of the volume to non-members of the society is $5.

A business volume for the Pittsburgh-Youngstown-Wheeling area, fully up to that of the first quarter in 1926, is predicted for the first three months of 1927 by the Allegheny shippers' advisory board, on the basis of a canvass by representatives of leading shipping and producing interests. The actual movement of freight is expected to be higher, and an estimate of 751,747 carloads is predicted, against 686,434 for the first quarter, 1926. This gain of 65,000 cars will come chiefly from a higher movement in coal, it is stated.

New Books Received

Aluminum and Its Alloys. By M. G. Corson. Pages 291, 5¾ x 9 in., illustrated. Published by D. Van Nostrand Co., 8 Warren Street, New York. Price, $8.

Engineering Metallurgy. By Bradley Stoughton. Pages 441, 5¾ x 9 in., illustrated. Published by McGraw-Hill Book Co., Inc., 370 Seventh Avenue, New York. Price, $4.

Joly Techniches Auskunftsbuch. Pages, 1468, 4½ x 7 in. Published by Auskunftsbuch-Verlag, Kleinwittenberg A. D. Elbe, Germany.

Wage Scales and Job Evaluation. By Merrill R. Lott. Pages 161, 5½ x 8½. Published by the Ronald Press Co., 15 East Twenty-sixth Street, New York. Price, $5.

Tool Control. By Anker L. Christensen. Pages 134, 5½ x 8½. Published by the Ronald Press Co., 15 East Twenty-sixth Street, New York. Price, $3.50.

Personnel Administration. By Ordway Tead and Henry C. Metcalf. Pages 543, 5¾ x 9 in. Published by McGraw-Hill Book Co., Inc., 370 Seventh Avenue, New York. Price, $5.

American Society for Testing Materials. Tentative Standards, 1926. Pages 1100, 6 x 9 in. Published by the American Society for Testing Materials, 1315 Spruce Street, Philadelphia. Price, $7.50 in paper and $8.50 in cloth.

Biennial Census of Manufacturers, 1923. Pages 1454, 6 x 9 in. Published by Department of Commerce, Washington, D. C. Price $1.75.

Market in South Africa for American Hoop Iron

JOHANNESBURG, SOUTH AFRICA, Dec. 10.—There is a good market here for hoop iron with mushroom grooves ⅛-in. wide in lengths of 300 ft., 20 rolls to a wooden hasp and in a case. All such hoop iron must be lacquered. Ordinary blue hoop iron has hitherto been used for the nearly 2,500,000 cases of fruit exported from South Africa annually. As each box is covered with three strips of iron, large quantities are imported, principally from Belgium and the United Kingdom. Current prices, delivered Capetown, Port Elizabeth or Durban are about £20 7s. 6d. per ton (4.41c. per lb.) for ½-in., BWG No. 28; £20 2s. 6d. per ton (4.36c. per lb.) for BWG No. 26; £20 (4.33c. per lb.) for ⅝-in., BWG No. 30; £19 17s. 6d. per ton (4.30c. per lb.) for BWG No. 28; £19 5s. per ton (4.16c. per lb.) for ¾-in. BWG No. 26. The largest demand is for BWG No. 28, ½ and ⅝ in. wide. These prices are for 5-ton lots, small extras being charged for smaller tonnages. Thus far hoop iron of this quality has not been offered in the South African market by American exporters, although this type and grade of material is widely sold by the United States in other foreign markets.

Malleable Castings Output in November Smallest in Two Years

WASHINGTON, Dec. 24.—Production of malleable castings in November totaled 45,793 net tons, as against 57,185 tons in October, according to reports received by the Department of Commerce from 139 identical plants, eight of which, with a monthly capacity of 4650 tons, were idle in November. This was the lowest output in more than two years. It compares with 60,800 tons a year ago.

Shipments in November aggregated 44,107 tons, against 53,405 tons in October, and bookings, 40,293 tons against 45,490 tons. Both were the smallest in over two years. The per cent of capacity operated in November was 42.7, against 52.6 in October. For the 11 months ended November of this year production amounted to 678,913 tons, compared with 671,766 tons for the corresponding period of 1925. Shipments were 640,816 tons and 641,892 tons, respectively; bookings, 567,898 tons and 599,242 tons, respectively.

SLAG BRICK MACHINERY

Komnick Process Developed in Germany Being Introduced in United States

The Komnick Machinery Co., 1010 Lafayette Building, Detroit, has been organized to introduce in the United States and Canada the Komnick drum process equipment for the manufacture of slag-lime brick. The machines will be made on contract. An installation has been made at Montreal, Que., and other prospective installations are under negotiation.

The Komnick machinery was developed at the F. Komnick Engineering Works, Elbing, Germany. Although using slag largely from gas plants, it is regarded as especially adapted to the conversion of blast furnace slag into brick and the process employed at several plants in Germany is described by the Komnick Machinery Co. as follows:

Slag from blast furnaces is run through water to crystallize it. It is conveyed by a self-unloader equipped with a distributing apparatus that automatically dumps the slag into a shaker, from which it drops upon a magnet pulley and belt conveyor and passes through a rotary screen, and then is conveyed to a storage silo.

The magnetic apparatus serves to remove for saving the small particles of iron in the slag. In daily operations as much as 10 tons of iron particles has been reclaimed. The larger pieces of slag which do not pass through the screen are conveyed to the crusher, from which they fall to a storage hopper.

Initial preparation of the slag now being complete, it is transported by means of a bucket elevator and through a conveying tube to a revolving screen cylinder and from there it is delivered to two hoppers which rest directly over two mixing drums. These hoppers are designed to carry sufficient raw material for the manufacture of 100,000 bricks per day of 10 hr.

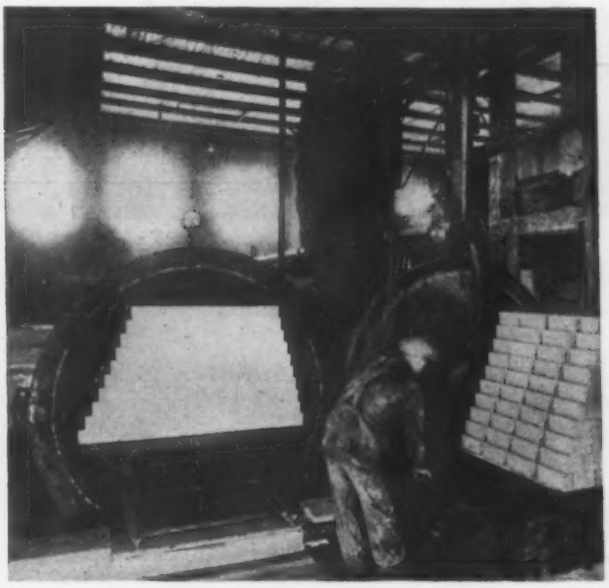
Burned lime is ground by means of an inclosed ball mill used in connection with the Komnick air separator. The ball mill, air separator and lime weighing device are designed to handle 4000 lb. of lime per hr.

The proportionate amount of lime having been transported by means of a helical conveyor to the mixing drum, and at the same time the proportionate amount of slag being deposited therein, the cover is secured and the drum is allowed to revolve. Then a small amount of water is added as fixed by test. If the lime is slow in slacking, live steam is added. After sufficient slacking, other slag is added and mixed. The mixing process is completed in 30 to 45 min.

This mixture is then dropped into a hopper underneath the mixing drum. This hopper is constructed in cone shape and at the bottom is a revolving plate or distributing apparatus which feeds the material to an edge runner mill situated directly under the hopper. This is equipped with heavy, broad steel runners which grind the mixture and rub the sand and lime together when the material passes between the runners and the steel rotary grinding surface of the mill. Thus the material is prepared by one pass through the machine for the molding of slag brick.

This machine at the same time automatically feeds a bucket elevator, which transports the prepared material into an automatic press feeder situated directly over the press service pan of each press. Each press has an hourly capacity of 2600 slag brick. These are placed on cars equipped with steel platforms which hold 880 German standard size brick each. When loaded these cars are taken to four hardening cylinders, the motive power being supplied by an electric-propelled transfer car operated by one man.

Curing of the brick occupies from 8 to 10 hr. under steam pressure of 120 lb. Each hardening cylinder is equipped with a swing-bolt type door at each end, the filling taking place at the press end and the discharge of cars at the rear and near the storage track which has a spur leading to the loading yard. The entire cylinder can be emptied in one operation.



The Komnick Slag Brick Press, Shown in the Illustration on the Left, Has a Capacity of 2600 Brick Per Hr. (Above) Hardening cylinder and brick loaded on self-propelled car

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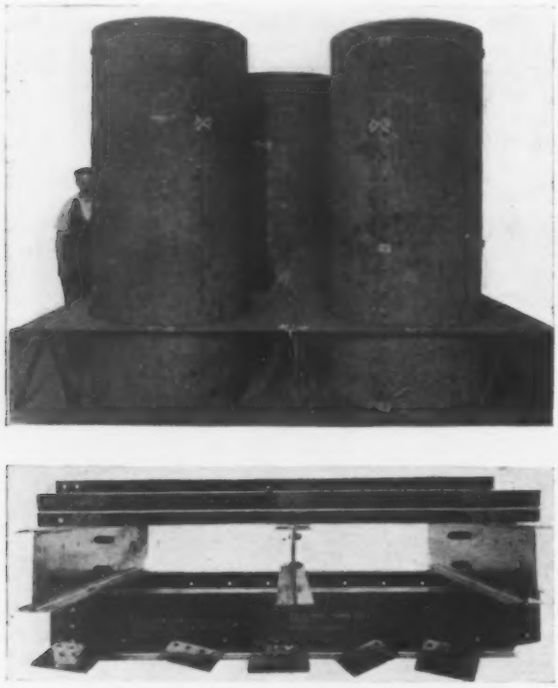
Stocks of steel bars are now only about one-fifth of what they were five years ago, according to O. W. Irwin, sales manager Truscon Steel Co., Youngstown, in the reinforcing steel bar department. He says that successful results have followed an appeal to contractors and other buyers, especially in Philadelphia and Brooklyn, to use American-made steel instead of German or Belgian steel, even though the latter can be laid down on the Atlantic seaboard at a lower cost than steel produced in this country.

The number of typewriters manufactured in the United States in 1925 was 730,343, as against 697,789 in 1923, an increase of 4.7 per cent, according to the Bureau of the Census. The number rebuilt decreased 15.2 per cent, with 39,235 in 1925 and 46,244 in 1923.

Rolled Manganese Steel Used in Large Electric Smelting Furnace

A recent example of the widening use of rolled manganese steel is its application in connection with certain members of a large electric smelting furnace. Outstanding characteristics of this steel, which contains 1 to 1.30 per cent carbon and 11 to 14 per cent manganese are high tensile and shearing strength; resistance to wear by impact and abrasion; and non-magnetic properties.

Because of these properties, this material has been selected for such parts as chute plates, liner plates,



The Rolled Manganese Steel Mantels and Floor Plates Used in an Electric Smelting Furnace Are Shown Above. I-Beams of the Same Material, Shown in the Lower View, Support the Floor Plates. Together They Form a Non-Magnetic Unit

flat bar chain links, railroad truck and car wearing parts, grizzly bars, wear plates, etc. An increasingly large tonnage of rolled manganese steel rods is being woven into screens used in screening coke, slag, ore, crushed stone, sand, gravel and other abrasive materials. Because of its non-magnetic properties, the use of this steel is being extended to the construction of electrical equipment.

The rolled manganese steel used in the parts for the electric smelting furnace here illustrated is that produced by Manganese Steel Forge Co., Philadelphia, under the trade designation of Rol-Man steel. It is said to have been selected for the construction of the unit described because it provided a light weight, high strength, non-magnetic material, free of eddy currents, which could be fabricated to the required specifications.

The upper view shows three mantels of the steel for a large electric smelting furnace. These mantels are of ¼-in. rolled manganese steel plate in the form of cylinders, 45¾ in. outside diameter and 8 ft. 7 in. long, each made up of four full length 90-deg. segments, rolled to a quarter cylinder. Seventeen holes, 11/16 in. in diameter and countersunk on the outside, are punched along each edge for connecting the segments together with inside butt straps. Twelve holes, 1-1/16-in. in diameter, equally spaced, are also punched around the cylinders at one end close to the top, for connecting to the suspension head. The mantels extend on both sides of rolled manganese steel floor plates, which are ¼ in. thick, are lap riveted together and provided with circular cut-outs to accommodate the mantels.

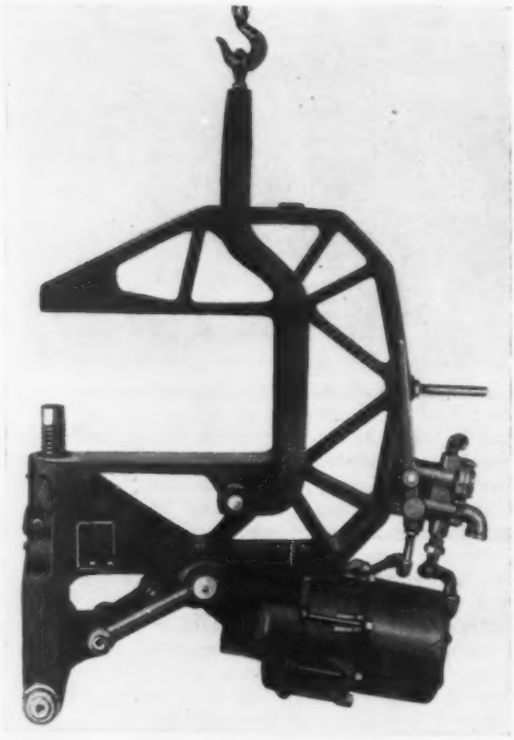
The lower view shows six of the Rol-Man steel 8-in. I-beams with 4 in. flanges. The I-beams, which serve as the supports for the floor plates, shown in the upper illustration, and together with them form a complete non-magnetic unit, are made up of two ¼ in. thick rolled manganese steel pressed plate channel sections, riveted back to back. Each I-beam is 15 ft. 2 in. long, overall, made in two 7 ft. 7 in. halves joined together with the splice plates and tie plates shown in the foreground.

Portable Riveter Has Alloy Steel Frame

Alloy steel truss frame construction, intended to assure rigidity and strength with the use of a minimum of metal, is a feature of a new portable compression yoke riveter being placed on the market by the Hanna Engineering Works, 1765 Elston Avenue, Chicago. The reach of the machine is 24 in.; the gap 15 in. and the pressure exerted on the rivet die is 50 tons, at 100 lb. air pressure. The weight of the machine is 1500 lb.

Suspended as shown, rivets are inserted from above and headed from below, which permits of pinch bug riveting speeds. Rivets may be placed in advance of the riveter, enabling the "rivet-sticker" to give a portion of his time to drift pins and stitching bolts without interrupting riveting operations. The machine may also be suspended with the dies vertical, cylinder up, or dies horizontal, cylinder up.

Mounting the air actuating cylinder so that the distance from the inside top surface or live stake to the bottom of the rear cylinder head is only 29 in., is another feature. This permits of using the riveter where the girders are laid down for riveting, the height



The Frame Is of Alloy Steel Truss Frame Construction, Which Permits Minimum of Metal

of which is usually influenced by what is most desirable when reaming.

Control of the intake and exhaust air is through the company's combination operating valve, which unit may be mounted at any convenient location and may be operated by hand or foot. Two air hoses with an inner area equal to that of a 1 in. pipe lead from valve to the cylinder. The valve combines two types, the balanced poppet and the balanced piston, and is said to provide an air-tight and free-moving valve. An important feature claimed for this valve is that any slight

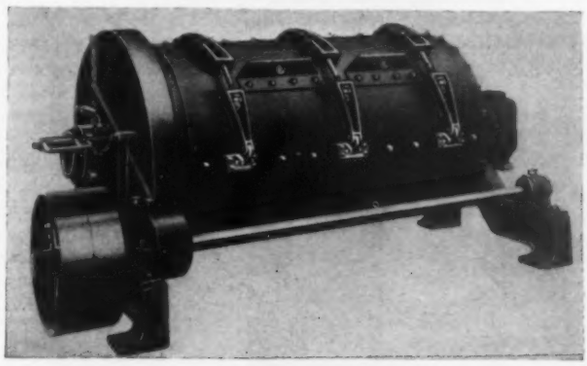
leakage at the valve will be from machine to exhaust, not from line to machine or line to exhaust.

The pressure exerting mechanism is a combination of simple lever and toggle which combine a long die stroke with a wide range of uniform pressure, as in other riveters built by the company. The first part of die stroke is rapid, the die or plunger speed gradually decreasing until it enters the uniform pressure area of the stroke. Where the work is lightest the speed is greatest; as the rivet head forms, the pressure increases, reaches a maximum and maintains it for several inches of piston travel.

Improves Door Clamp on Tumbling Mills

A door clamp of improved design is a feature added recently to tumbling mills built by the Whiting Corporation, Harvey, Ill.

The clamp consists of cast steel sliding bars arranged in pairs and mounted on the door. Cast steel links connect the bars to the sides of the barrel and



Tumbling Mill Equipped with Improved Door Clamps

1¼-in. diameter tension bolts are used to draw the bars tightly together when the door is in place. The sliding bars are mounted so that they pivot as well as slide, permitting alinement in all directions. The door is lifted into place, the links are swung into sockets, which are riveted to the side of the barrel, and the tension bolts are turned up with a socket wrench. The links provide a toggle action which pinches the door edges tightly against the shell, and the tension on the bolts pulls the sides of the shell against the door.

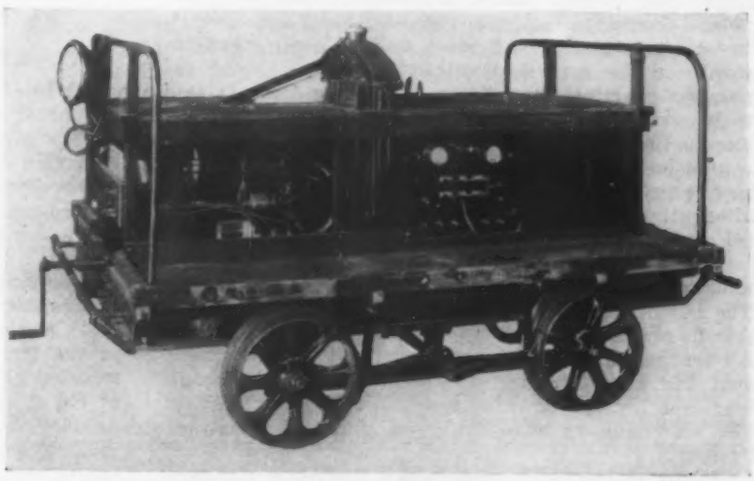
Self-Propelled Welding Car

What is said to be the first gas-electric drive, self-propelled welding car, brought out recently by the Electric Arc Cutting & Welding Co., 152 Jelliff Avenue, Newark, N. J., is shown in the acccompanying illustration.

This equipment consists of the company's standard gas-engine set mounted in a standard track car and arranged for taking on and off the track by means of the frame sliding on the rails. The car is equipped with a standard vehicle series motor and is chain driven. Standard wheels and axles are employed and one side is insulated, which is also standard railroad practice. Control is through an interlocking arrangement providing even speed gradation ahead and reverse and a neutral position for welding. Each position is locked so that when the engine is delivering power the car cannot be moved in the other direction; when welding, it cannot be moved at all. A special lighting transformer is provided for illuminating the work at night. There are headlights and tail lights on the car.

Exclusive features claimed for the gas engine include the oiling system, which is interlocked so that the ignition magneto is cut off should the oil be kept too low or the pump fail to work. In addition to being equipped with mechanical governor limited to various speeds by the interlocking mechanism, the gas engine is also arranged with throttle governor for welding, so that the engine can idle until the electrode is actually touched to the work. The engine immediately resumes idling when the arc is broken. This, it is thought, should greatly prolong the life of the apparatus.

Exclusive features claimed for the welding generator include: both alternating and direct current for all arc welding; series differential field for 20 volt metallic arc and series; compound field for 40 volt carbon arc; ball-bearings, interpole commutating field and shaft extension; and 110 or 220 volts provided for lights, drills, grinders, etc.; and automatic reactor spring adjusted for all arc welding.



A Standard Gas-Engine Set Is Employed. Control is through an interlocking arrangement which provides a neutral position for welding

South Africa Uses American Agricultural Machinery

JOHANNESBURG, SOUTH AFRICA, Dec. 10.—American manufacturers are the largest shippers of agricultural machinery to the Union of South Africa, with Canadian makers the chief competitors for this business. In accessories for agricultural machinery, however, American manufacturers rank about third, the United Kingdom and Canada being foremost. As a result, American made plows are often provided with shares and other fittings of Canadian or British manufacture. American prices for accessories of this kind are only about 2 per cent higher than the Canadian and about 3 per cent more than the English, so that slight concessions might develop a larger market here. It is noteworthy, however, that most of the accessory business is done on consignment by Canadian and English makers, so that it would be necessary for the American sellers to follow this method if they were to compete seriously for the business.

Brooklyn Jobber Pays Bonus

David H. Smith & Sons, iron and steel jobbers of Brooklyn, N. Y., have voted a cash and stock bonus plan for employees to be awarded on the following basis: Employees with one year of service to receive one week's pay; with two years' service, two weeks pay, and so on, with a week's pay added for each year of service up to and including five years. Employees may elect to receive stock, one and a half shares of stock to be given for each $100 of bonus, and the odd amount, if any, to be paid in cash. For the past three years the company has paid 8 per cent dividends on its stock, and there is no likelihood that the rate will be lowered in the coming twelve months.

New Line of Motor-Driven Grinding and Buffing Machines

The Hisey-Wolf Machine Co., Cincinnati, has brought out a new line of motor-driven double-end grinding machines, and two types of buffing and polishing machines, one with open type and the other with incased type spindle extensions.

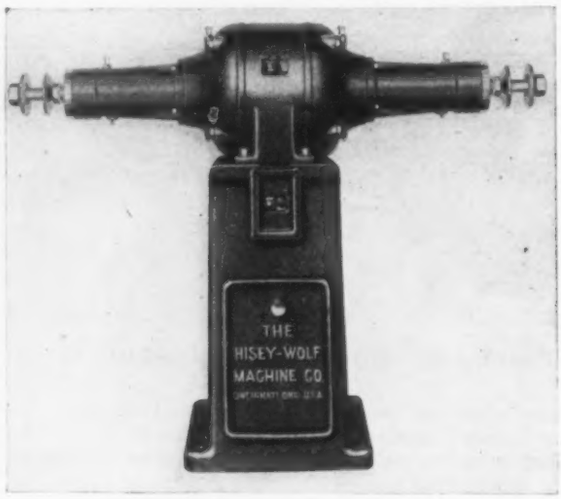
Five sizes of the floor stand grinder are available, equipped with two grinding wheels ranging in diameter from 7 to 14 in., and in width of face from ¾ to 2½ in. The 7, 10 and 12 in. machines are also furnished with bench base mounting.

The floor stand buffing machine with open-type spindle extension is also available in five sizes, being arranged for two buffing wheels ranging in diameter from 8 to 18 in., and in face from 1 to 3 in. The two smallest sizes are built with bench base mounting. The incased spindle buffing machine is built in four sizes corresponding to the four largest sizes of the machine with open-type spindle extensions. The 10-in. wheel machine of this type is furnished for bench mounting.

All of these machines are available with either alternating or direct current motors. Single-phase alternating-current machines are equipped with improved commutating-type repulsion-induction motors, which, it is stated, will start and pick up speed instantly under any load within twice their rated capacity. Starting current under all conditions is said to be unusually low. It is claimed that low voltage, due to line drop and other existing conditions which cannot be overcome, has no objectionable effect on the new single-phase machines. Two and three phase alternating current machines are equipped with squirrel cage motors.

Oversize ball bearings are employed, and are mounted in end heads in close proximity to the wheels. The buffing and polishing machines with incased type spindle extensions are equipped with four ball bearings. All bearings are completely inclosed and protected from dust and grit. Bearing oil reservoirs contain enough lubricant for two or three months of ordinary service. The oil chambers have drain-put plugs to permit of flushing.

Motor starter with push button control is standard equipment on all of these machines, all motor starting and switch equipment being in accordance with the standards of the Electric Power Club. Grinding wheels are of diameters in proportion with motor speeds to give safe peripheral speeds as recommended by American Engineering Standards Committee. Wheel guards are of the full safety combination pattern and are adjustable to compensate for the wear of the grinding wheel.



Double-End Floor Grinder. For single-phase a.c. current an improved commutating-type repulsion-induction motor is employed.

Buffing Machine With Incased Spindle Extensions. An open-spindle type unit in also available

Sales of American Tool Steel to South Africa Decline

JOHANNESBURG, SOUTH AFRICA, Dec. 10.—Sales of American tool and drill steel to South Africa have recently dropped from second to third place, Swedish steel consumption now being second only to the British product. The Swedish steel is of first grade and, although almost 40 per cent higher in price than either the German or French product, is consumed in sizable quantities.

Mining drill steel, either hexagonal or octagonal is sold at about 36s. per 100 lb. ($8.71), c.i.f., while steel of special analysis brings about 61s. ($14.76) per 100 lb. delivered to any large consuming point in the South African Union. Swedish makers of tool steel maintain stocks at Johannesburg, Salisbury and Durban, from which they deliver direct to the mines.

Bureau of Mines Report

A brief annual report of the Bureau of Mines for the fiscal year ended June 30 last has been issued. It is concerned largely with questions of safety, efficiency in mining and economics. Description is given of the Bureau's activities during the year along technical lines, including the work on helium and metallurgical investigations in both ferrous and non-ferrous metals.

Beneficiation of high-silica ores, production of ferromanganese from low-grade ores, direct production of steel, and case carburizing of steel are the main topics in the ferrous group. The bureau is particularly interested in the use of non-coking coals in the reduction of low-grade ores. It has thoroughly investigated the production of sponge iron and its utilization. It is now making a survey of all the work done on direct processes, seeking to determine what fundamental information is still needed to develop them. Gaps in the present fund of information will be filled through laboratory experiments.

Coolant Circulating Pump for Machine Tools

Simplicity of installation and long life are among the features stressed in connection with the rotary pump here illustrated, which is being marketed by the Tuthill Pump Co., 131 West Sixty-third Street, Chicago.

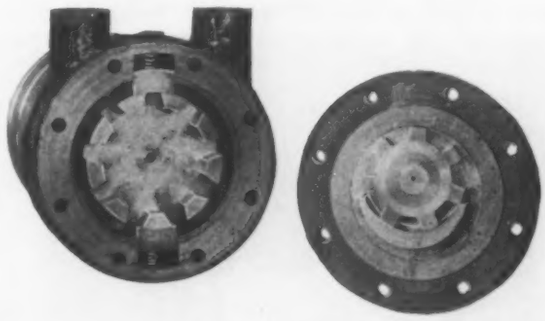
The machine is intended for use on machine tools and is arranged for variable and reversible flow. It consists of a housing in which rotate an internal or driving gear, and the idler or driven gear. The latter, together with the crescent member, is mounted on the cover, as shown, and when the cover is in place, the idler gear and crescent fill the space within the internal gear. The pumping action is produced when the teeth unmesh on one side and draw in the liquid. The coolant is then carried past the crescent member to the other side of the pump and forced into the discharge outlet by the meshing of the teeth. The action is continuous, and is said to produce a steady, non-pulsating stream.

The space between the intake and discharge sides of the pump is sealed by a hardened steel land, which is held in place by a light spring. Being subject to oil pressure above and below it, this member adjusts itself up and down to maintain the required discharge of liquid. When pumping the full amount, the land is down close to the rotor or internal gear, effecting a seal between the two sides of the pump. When the liquid is shut off at the discharge, the pressure causes the land to rise and permit the liquid within the pump to by-pass. This arrangement is stressed as eliminating the necessity of a separate by-pass, simplifying installation. In permitting small chips and grit to pass without cutting the walls of the pump, the balanced lands are also said to contribute to longer life of the machine.

In the reversing pump the crescent and idler gear are mounted on a separate member and journaled in the cover. This member is arranged so that it may rotate through 180 deg. as the direction of rotation of the pump shaft is reversed. This causes the stream of liquid to be pumped in the same direction as previously and thereby provides for the reversing action necessary for screw machines, planers, etc. Check balls are not used, and the reversing of the pump is said to be simple and positive.

Another feature is the arrangement of ports, both of which are turned in the upward position. This is intended to form a trap which holds part of the liquid at all times and keeps it prime. It is said that in many applications the usual ball checks or foot valves

The Internal Gear, Idler Gear, Crescent and Hardened Steel Land Are the Principal Members of the Pump



employed in the end of the suction pipe can be eliminated. The pump shaft is long and of large diameter and the gears are of steel and are hardened. The packing is of rolled lead foil and graphite. The dimensions of the pump permit it to be mounted on the usual pump bracket.

Electrically-Heated Melting Pot With 100 Lb. Lead Capacity

Rapid heating and compactness are features of an electrically-heated metal melting pot added recently to the line of the Harold E. Trent Co., 259 North

Melting of the 100 Lb. of Metal Is at the Rate of 35 to 45 Min.

Lawrence Street, Philadelphia. The capacity of the pot is 100 lb. of lead.

In this design the problem of suitable terminal outlets has been met by making a cast terminal box with an outlet in the bottom which can be arranged for BX connection or rigid metal conduit. The terminals are located horizontally to facilitate connection and inspection. Another feature of the pot is its portability. When required, eyebolts for attachment to the rim of the casting can be supplied, these eyebolts being used when pouring directly from the pot into the bearing. The eyebolts in conjunction with the crane hooks act as a fulcrum and facilitate pouring.

The shape of the crucible, which is of cast iron, has been proportioned to withstand the strain incident to the heating and cooling of a considerable mass of metal. The casing is of sheet steel with welded seams, reinforced with steel bands. The use of temperature control is recommended, such control being stressed as preventing overheating and reducing current consumption. The pot can be employed also for melting salts requiring temperatures less than 1000 deg. Fahr.

The Ornamental Iron Manufacturers' Association of Southern California, Los Angeles, has arrived at the conclusion, according to Secretary Wilbur S. Sample, that the combined capacity of the plants of members is far in excess of the amount of work available for a long time to come. The secretary's bulletin issued shows that ornamental shops have an investment of nearly $3,000,000, a capacity of nearly $14,000,000, annual average output of slightly over $8,000,000, and a cost of almost the latter amount, leaving an assumed profit of a little less than $140,000.

NEW GEAR HOBBER

Steel Spur Gears Up to 3 Pitch, 36 In. in Diameter and 16 In. Face Cut on Production Basis

A manufacturing hobbing machine similar to that described in THE IRON AGE of Jan. 31, 1924, page 361, but larger, has been placed on the market by Gould & Eberhardt, Newark, N. J.

The new machine, designated as the No. 36-HS, is being offered for cutting spur gears up to 3 pitch in steel on a production basis, and up to 36 in. in diameter. It has a normal capacity for gears up to 42 in. in diameter. It is said to be especially adapted for cutting of transmission gears, such as used in tractors and trucks, and gearing used in mining and hoisting equipment, as well as for other general industrial gears of medium sizes.

Among the manufacturing features of the new machine is the powerful worm and worm wheel drive to the cutter spindle, which is arranged so that it may be swiveled from 0 to 15 deg. to accommodate single-, double- or triple-thread hobs for both roughing and finishing. The indexing worm wheel, semi-steel, and of coarse pitch, is 24 in. in diameter, and is driven by a hardened and ground worm. The gear train is of the balanced type, having exactly the same number of gears to the cutter as to the work spindle, which arrangement is intended to assure uniformity of rotation between the cutter and the gear blanks, producing extremely accurate gears.

The vertical cutting principle employed is emphasized as making possible the substantial support of gears up to the full capacity, permitting feeds and speeds that are comparable with those now being obtained on smaller gears, and which were not possible heretofore on the larger gears in a hobbing machine. The cutter carriage is arranged with the power traverse of 100 in. per min. to move the cutter rapidly in either direction and may be operated with the work and cutter spindles either rotating or idle. The rapid traverse operating lever is interlocked with the feed lever so that neither the feeding nor the power traversing movement to the cutter can be started without the other movement being first disconnected. Additional provision is made to prevent accidental operation of the power rapid traverse in its downward direction.

The power rapid approach brings the hob to the cutting position at 100 in. per min., the hob being stopped automatically by means of an adjustable stop cam. The feeds may then be started by tripping the feed lever. The power rapid reverse completes the cutting cycle by returning the cutter carriage to its upper position to permit the rapid unloading and reloading of gears. The work arbor support accommodates gears up to 24 in. diameter. The movable arm mounted on the box-type column is counterbalanced, so that when the operator elevates it a locking pin is released automatically, to permit swinging the arm out of the way quickly.

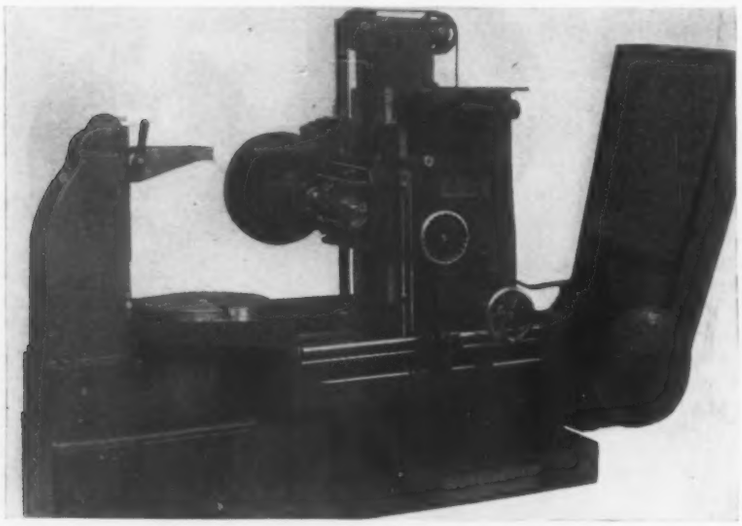
The drive is through a plate-type clutch pulley which is mounted on Timken roller bearings and operates at constant speed. All of the drive parts of the machine have been segregated in a case mounted on the base of the machine at the rear. Lubricant is pumped into a distributing pan which serves all of the mechanism in this case, thereby automatically oiling all of the principal mechanism. The index change gears and cutter speed gears are entirely inclosed in oil-tight compartments and a stream of oil constantly flows over the gears. A centrifugal pump supplies coolant to the cutter. Instead of being poured over the hob from the end of a pipe, the coolant goes through the cutter carriage and is forced on the hob, flooding it without splashing. The coolant is shut off automatically when the hob rotation is stopped.

Work and Cutter Spindles Adjustments

Both the work spindle and cutter spindle have tapered bearings of substantial proportions, and the means provided for adjustments are stressed as being somewhat unusual. The usual practice of making an adjustment on a tapered spindle is to take off from the end adjustment a sufficient amount of metal to make the taper fit tighter. This is eliminated on this new machine as either the work spindle or cutter spindle may be adjusted in place in the machine. Separate adjustments are provided for the taper diameter fit and the end fit, and either may be made independently of the other.

In order to take advantage of the full length of the hob, a hob positioning device is provided, making it possible to shift the hob from a dull to a sharp position, without taking the hob from the arbor and inserting spacing collars.

The machine can be arranged with automatic infeeding attachment for hobbing worm wheels. For motor drive a 7½-hp. 1200-r.p.m. motor is mounted on a bracket over the gear case at the rear. The drive from the motor is by silent chain, which is entirely inclosed in a sheet metal guard. A full complement of feed and cutter speed gears is furnished, and also indexing gears to cut from 6 to 50 teeth and beyond that up to 150 teeth, excepting primes and their multiples.



Manufacturing Hobbing Machine for Steel Spur Gears Up to 3 Pitch and 36 In. in Diameter. Features stressed include the powerful worm and worm-wheel drive to the cutter spindle, balanced type gear train and method of adjusting the work and cutter spindles. An automatic infeeding attachment for hobbing worm wheels is available

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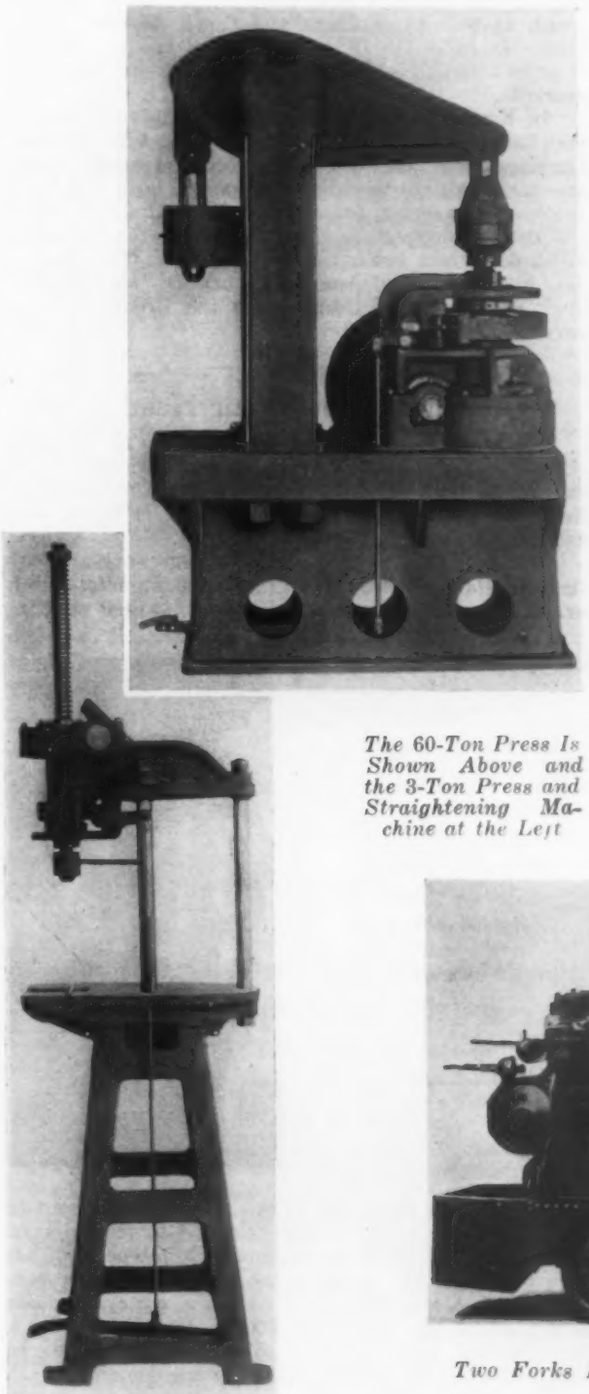
The Chain Belt Co., Milwaukee, is erecting a new building on a 59-acre tract at West Milwaukee to house its engineering and structural work. After Jan. 1 all of the company's engineering work, including the Rex traveling water screens and Rex elevators and conveyors, will be done at the new plant.

Power Presses for Straightening, Bending and Assembling Operations

The General Mfg. Co., Detroit, is adding to its line two new power presses, one of which is a 60-ton four-post unit and the other a 3-ton three-post machine. Flexible control is an outstanding feature of both.

Both presses employ a friction brake band, similar to the service brake of an automobile, as a clutch. The power applied is in direct relation to the pressure exerted by the operator on the foot pedal and may be varied from a few pounds up to the capacity of the machines. The ram can be stopped at any point in its travel, and is arranged to return to its up or normal position immediately upon release of the foot pedal.



The 60-Ton Press Is Shown Above and the 3-Ton Press and Straightening Machine at the Left

The 60-ton press is adapted for straightening and bending operations on a production basis. The power for this machine is transmitted through the rear drive head and the rocker arm having a leverage of 2½ to 1 to the main front ram. The four posts hold down the bearing at the center of the rocker arm. The nose piece on the main front ram may be changed conveniently for other work. The stroke and recommended speed of the ram are 4 in. and 48 in. per min., respectively. A 10-hp. 1200 r.p.m. motor is required for direct motor drive.

The distance from the table to the end of the ram up is 21 in., and the throat or distance from the center of the ram to the front of the column is 6⅞ in. The width of the table is 24 in. and the height of the table from the floor is 30 in. The floor space occupied by the 60-ton press is 36 x 60 in., and the height over all is 88 in. The net weight of the belt-driven machine is 6600 lb.

The 3-ton three-post press and straightening machine is similar to the 8- and 20-ton units described previously in THE IRON AGE, and is also of screw type. It is intended for straightening and assembling operations. Fixtures are available to permit the work to be straightened and tested on centers as many times as necessary without removing the part from the fixture until the operation is completed.

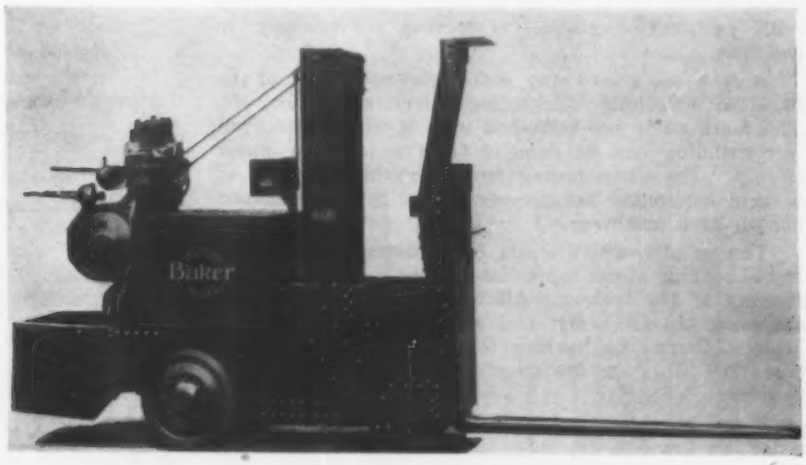
For manufacturing purposes the stroke of the ram, 6 in., and the opening between the nose of the ram and the table, 12 in., have been standardized, but machines with 9 in. or 12 in. stroke and with any special opening can be furnished. The head of this machine is a unit and can be used with special fixtures. It can also be furnished for either belt or motor drive. A 2-hp. motor is required for direct motor drive.

Ram travel of 135 in. per min. is recommended. The floor space occupied by the machine is 24 x 24 in., and the height over all is 90 in. The net weight of the belt-driven press is 700 lb.

Truck for Handling Large Crates

Facility in the handling of large crates or similar packages is claimed for the truck here illustrated, which has been placed on the market by the Baker-Raulang Co., Cleveland.

The machine is an adaptation of the company's Hy-Lift truck. The carriage is fitted with two forks in place of the usual platform and clamps are provided for holding either one or two packages. The machine was originally developed to handle electric ice cream cabinets for soda fountain use. These cabinets are packed in crates of uniform size and 3 x 3 in. cleats are nailed to the bottom, thus raising the crate off the floor so that it may be picked up with the forks.



Two Forks Replace the Usual Platform and Clamps Are Provided for Holding Packages

The clamping action is automatic and takes effect as soon as the truck commences to lift. One crate may be picked up and placed on top of another and then both of them carried on one load. In this case the lower clamp drops back out of the way and the upper clamp comes into operation.

Vertical-Motor-Driven 18-In. Disk Grinder

Another disk grinder with a vertical-motor-drive arrangement, added recently to the line of the Gardner Machine Co., Beloit, Wis., is here illustrated. The machine carries an 18-in. wheel and, as in the case of the 72-in. unit described in THE IRON AGE of Dec. 2, compactness is an outstanding feature.

The grinding wheel travels in a horizontal plane and is supported by a wheel collar mounted on the rotor shaft which forms the driving spindle of the

Vertical Motor Arrangement Provides a Compact Unit. The motor frame serves as the machine base

machine. The motor frame serves as the machine base. The height of the machine, which measures 22⅝ in. from the floor to the grinding member, permits the operator to sit while at work, although a special pedestal can be provided so that the operator may stand during the grinding operation. Remote control with push-button station is located conveniently on the base.

A cast-iron guard ring is fastened to the top of the base for attaching workholders, dressing device, etc. The machine is not equipped with a water tank, but wet grinding can be done if from a separate water supply. The wheel truing device provided consists of a rigid horizontal bar dresser of the type in common use on such machines.

The spindle, which is 2½ in. in diameter, carries a radial bearing at the top and a heavy-type deep-grooved bearing at the bottom. All bearings run in oil, and are protected from dirt and grit. Oil level pipes are brought from each bearing to the outside of the machine for filling or draining the oil from the bearing housing.

Floor space occupied by the machine, which is designated as the No. 88, is a circle 25 in. in diameter. The power required is 5 hp. The weight for domestic shipment is 660 lb.

To furnish power to the southern mining district of the Soviet Union, in which are included the iron mines of Krivoi Rog and the manganese fields of Nicopol, Russia, the Dnieper River power project in Soviet Ukraine, to develop 150,000 hp. at the outset, is evidently engaging American attention, Col. Hugh L. Cooper, American consulting engineer, having sailed for Moscow, accompanied by J. P. Ohsol, vice-president Amtorg Trading Corporation, 165 Broadway, New York.

Bolt and Nut Specifications Vary in Different World Markets

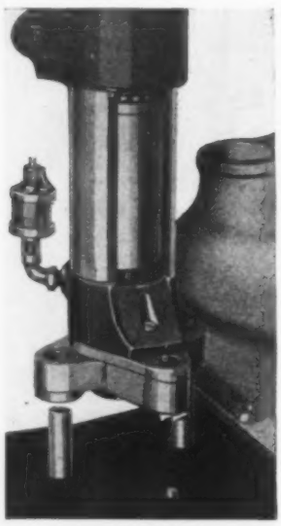
The bolt and nut requirements of various world markets differ considerably and have at times caused confusion among makers as to the kind of specification used. Bolts and nuts with American threads are bought in the Philippines, Cuba, Central American markets, Hawaii and in the West Indies, but in all these markets, except the Philippines, the Whitworth thread is also used. British specifications are used on bolts and nuts in South Africa, India and all British possessions, as well as in China and South American countries. In India the German standard is also used and it is an alternative in China and some South American markets.

In Europe, with the exception of England, the German standard is almost exclusively used on bolts and nuts. Carriage bolts and nuts, cup square and round square, are used with the so-called German or large flat head, in South American countries, India and China, while the British possessions generally prefer the British or mushroom form head, which is smaller. This head is also used in Central American markets. Mexico, however, uses both the German and the British head on carriage bolts.

Offset Spot Facing Head

An offset spot facing head designed to facilitate counterboring and spot facing operations, in places that cannot be reached with the tool mounted directly in line with the drilling machine spindle, is being marketed by the Gairing Tool Co., Detroit.

The device, shown herewith in the working position, is clamped around the machine spindle and is arranged so that it can be raised and lowered with the



The Tool is Clamped Around the Machine Spindle and Is Raised and Lowered with the Spindle

spindle, to and from the work. It is guided by two pins projecting from a plate fastened to the table of the drill press, which arrangement is intended to assure rigidity. By dropping the casting over the permanent pilot, directly underneath the cutter, the use of a pilot in the customary manner is eliminated. A disappearing pilot operated by a foot pedal can be attached when the weight of the casting demands it.

The cutter is driven by alloy steel gears and thrust is taken by a ball thrust bearing. The housing of the device is a steel forging and serves as an oil reservoir fed by the sight-feed oiler located as shown.

Food prices are reported by the United States Bureau of Labor Statistics to have been 1 per cent higher in November than in October, but about 3.3 per cent lower than in November, 1925. The index level is 54 per cent above November, 1913. Compared with the average of 1913 the figure for last month is 61.6 per cent up.

Furnace Design for Fuel Efficiency

Proper Fuel Combustion Combined with Adequate Means of Controlling Flow of Hot Gases

ONE section of the Robert Henry Thurston lecture, delivered before the American Society of Mechanical Engineers, in New York, on Dec. 7, by Dr. Cecil H. Lander of London, England, referred to the efficiency of industrial furnaces. The following paragraphs are taken from the address as delivered:

Furnace Design

It is well known that the efficiency of industrial furnaces is generally low. The importance of a systematic study of re-heating, forge annealing, and all other classes of furnaces has of late repeatedly been urged, both in the interests of fuel conservation and of industrial prosperity.

Conditions governing the efficient combustion of fuel are now well understood and, if proper control is effected, the thermal loss in unburned products need not be considerable, either with solid, liquid or gaseous fuel. The real problem in furnace work is the successful application of the heat generated to the purposes in hand. This involves an understanding of the fundamental physical principles underlying the mode of heat transfer from the hot gases flowing through a furnace to the charge, whether directly by radiation and convection, or indirectly by radiation from the heated walls and roof. The effective utilization of the sensible heat of the flue gases, for the preheating either of the charge or of the air for combustion, is of course also a fundamental condition of high furnace efficiency.

Russian Metallurgist's Studies

The work of Groume-Grjimailo on the flow of gases in furnaces has recently attracted considerable attention, since it represents a definite attempt to analyze the movement of the gases with a view to applying the knowledge gained to the more scientific design of furnaces. The results can, of course, represent at best only the general tendencies of the gaseous flow, and are not capable of yielding exact numerical information; but their application to furnace design has been shown to effect considerable practical improvement.

The problem of heat transfer inside a furnace, however, is very complex, and the important part played by radiation in the heating of the charge cannot be left out of account.

The remarkable success which has attended the application to airplane design of models, based on Lord Rayleigh's principle of similarity, suggests a further possible application to problems of heat transfer. The principle can be extended to considerations of heat transmission, but the conditions which it lays down for true similarity between model and full scale may be difficult of practical realization, if not impossible. The method offers interesting possibilities as a means of obtaining, from determinations on a model, quantitative results applicable to full-scale furnaces.

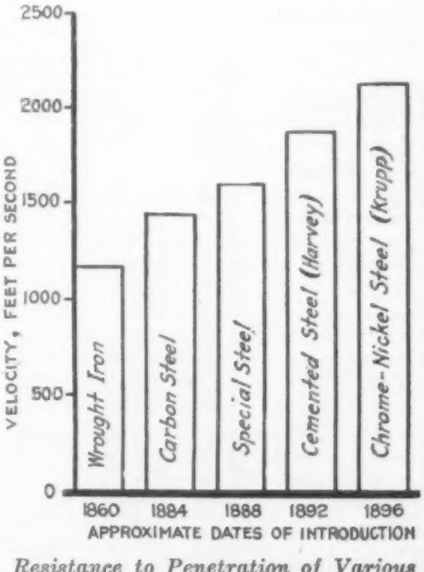
Many articles have appeared in THE IRON AGE during the past seven years in which the work of the Russian metallurgist Groume-Grjimailo was a factor. Several of these were translations made by A. D. Williams from writings of the Russian scientist. Open-hearth furnaces were covered in 14 articles appearing as follows: Page 35, Jan. 1, 1920; page 119, Jan. 8, 1920; page 317, Jan. 29, 1920; page 475, Feb. 12, 1920; page 805, March 18, 1920; page 1225, April 29, 1920; page 1510, May 27, 1920; page 319, Aug. 5, 1920; page 719, Sept. 22, 1921; page 577, March 2, 1922; page 717, March 16, 1922; page 853, March 30, 1922; page 1075, April 20, 1922, and page 1279, May 11, 1922. Hot blast stoves were covered in three articles on page 1527, June 9, 1921; page 1613, June 16, 1921; and page 1677, June 23, 1921. Reheating furnaces were covered in three articles on page 465, Aug. 24, 1922; page 537, Aug. 31, 1922; and page 1013, Oct. 19, 1922. The last mentioned referred to soaking pit furnaces.

Improvement in Quality of Steel Measured in History of Armor Plating

In his presidential address to the Société des Ingénieurs Civils de France, L. Baclé gave a short summary of the history of armor plating, which has been abstracted by *Iron and Coal Trades Review*. That portion of the story which may be said to measure the improvement in metallurgical qualities of the material may be summarized as follows:

If we consider a 200-mm. (7.9-in.) armor plate attacked by a 194-mm. (7.6-in.) gun, puddled iron offers sufficient resistance to require a velocity in the projectile, for perforation, of 385 m. (1170 ft.) per sec. This velocity would have to be increased to 471 m. (1440 ft.) per sec. on replacing the wrought iron with ordinary carbon steel. A special steel, developed about 38 years ago, increased the required velocity further to 528 m. (1610 ft.) per sec. and gave the same resistance as a wrought iron plate 380 mm. (15 in.) thick.

When the cementation process was developed by Harvey in the United States a plate was obtained requiring a perforation velocity of 612 m. (1870 ft.) per sec. This velocity is 60 per cent higher than that required for wrought iron and 30 per cent above that of ordinary carbon steel. Further improvement in the resisting qualities of the armor, such as were made by the Krupp process, in which nickel and chromium formed important parts, raised the required perforation velocity to 700 m. (2130 ft.) per sec. This resistance was equivalent to that of a wrought iron plate 512 mm. (20.2 in.) thick, or more than 2½ times the thickness of the higher quality material.



Resistance to Penetration of Various Armor Plate Materials, Measured by the Required Striking Velocity of a Projectile of Substantially the Same Diameter as the Plate Thickness

Machinery Exports Continue High

Promise to Exceed 1925 by Fair Margin—Imports Already Above All of 1925—Mining and Oil-Well Machinery Lead Gains

WASHINGTON, Dec. 27.—Exports of machinery of all kinds, as well as of industrial machinery, for the calendar year 1926 promise to exceed by a comfortable margin those for 1925, while imports of industrial machinery will also show a considerable increase. For the 11 months ended November, 1926, exports of all kinds of machinery aggregated $368,048,685, against $331,815,960 for the corresponding period of last year.

Exports of industrial machinery, as classified by the Division of Statistics, Department of Commerce, were valued at $164,206,998 for the 11 months ended Nov. 30, against $156,410,452 for the corresponding period of last year. This classification includes power-generating machinery, except electric and automotive; construction and conveying machinery, and mining, oil-well and pumping machinery. "Other industrial machinery," including such items as mill equipment, electrical machinery, typewriters, etc., was exported to the value of $49,746,873 during the 11 months ended November, 1926, against $52,922,796 for the corresponding period of 1925, a decline of more than $3,000,000.

For November, 1926, exports of all kinds of machinery were valued at $32,694,793, as against $27,965,148 in October and $29,436,903 in November, 1926. Power-driven metal-working machinery to the value of $1,274,446 was exported in November of the present year against $1,477,023 during the corresponding month of 1925, while for the 11 months ended November, 1926, the value was $13,113,626, against $16,156,190 for the corresponding period of 1925.

High Imports Continue

Imports of industrial machinery during the 11 months ended Nov. 30, were valued at $15,011,478, compared with $10,295,082 for the corresponding period of 1925. Imports of this class of machinery in November, 1926, were valued at $1,156,170, against $1,180,048 in November, 1925. Imports of machinery as listed in THE IRON AGE table were valued at $16,096,841 during the 11 months ended November, 1926, against $10,361,555 for the corresponding period of last year. For November, 1926, the value was $1,210,868, against $1,247,115 in October, and $1,107,172 in November, 1925.

Exports of power-driven metal-working machine tools in November, 1926, represented 443 machines, valued at $608,593, against 368 units, valued at $436,086, in October.

Exports of agricultural machinery and implements in November, 1926, were valued at $4,585,199, against $3,603,397 in October and $4,617,476 in November, 1925, while the respective values for the 11 months ended November, 1926 and 1925, were $80,700,632 and $70,460,789. Exports of wheel tractors and plows again decreased. There was also a substantial decrease, as pointed out by the Agricultural Implements Division, Department of Commerce, in drills and seeders and

Machinery Exports from the United States

(By Value)

	November, 1926	November, 1925	Eleven Months Ended November, 1926	Eleven Months Ended November, 1925
Locomotives	$47,412	$1,027,702	$4,837,857	$6,309,263
Other Steam Engines	398,442	70,148	1,262,913	809,092
Boilers	235,201	128,539	1,629,826	1,811,605
Accessories and Parts	186,193	165,268	1,710,550	1,937,398
Automobile Engines	475,598	523,048	12,181,580	14,295,872
Other Internal Combustion Engines	858,677	910,855	8,508,769	8,697,852
Accessories and Parts	358,135	305,138	3,957,757	3,757,758
Electric Locomotives	167,810	205,055	2,498,331	685,535
Other Electric Machinery and Apparatus	653,884	563,993	6,756,466	6,307,021
Excavating Machinery	272,535	437,543	4,247,665	3,721,991
Concrete Mixers	62,521	55,121	694,130	712,853
Road-Making Machinery	127,393	75,296	1,634,676	1,293,606
Elevators and Elevator Machinery	423,573	216,599	4,784,898	2,062,825
Mining and Quarrying Machinery	1,193,048	1,123,301	13,753,946	9,474,376
Oil-Well Machinery	1,912,613	1,182,365	13,928,523	8,930,041
Pumps	548,207	680,800	5,561,814	6,838,494
Lathes	195,851	317,297	1,585,830	2,270,199
Boring and Drilling Machines	55,136	22,921	758,255	585,589
Planers, Shapers and Slotters	29,961	39,076	300,832	533,619
Bending and Power Presses	82,881	40,535	1,259,570	536,348
Gear Cutters	8,724	56,949	402,337	783,752
Milling Machines	73,762	164,138	891,241	1,522,575
Thread-Cutting and Screw Machines	97,162	87,763	636,272	1,092,017
Forging Machines	70,549	17,254	991,227	218,388
Sharpening and Grinding Machines	177,911	155,923	1,833,017	2,850,223
Other Metal-Working Machinery and Parts	393,086	437,246	4,275,104	4,965,132
Textile Machinery	733,010	915,971	9,353,636	10,089,932
Sewing Machines	736,017	537,625	7,945,668	7,906,125
Shoe Machinery	114,589	68,035	1,226,932	1,235,443
Flour-Mill and Gristmill Machinery	36,808	61,915	791,683	800,603
Sugar-Mill Machinery	497,751	1,212,074	3,710,129	7,576,281
Paper and Pulp-Mill Machinery	592,601	118,159	3,368,672	1,483,285
Sawmill Machinery	68,363	54,603	900,226	715,940
Other Woodworking Machinery	138,510	124,302	1,122,459	1,249,420
Refrigerating and Ice-Making Machinery	610,393	262,565	4,588,151	2,137,440
Air Compressors	438,978	254,787	4,350,325	3,570,581
Typewriters	1,289,899	1,448,056	16,536,919	16,199,805
Power Laundry Machinery	40,957	37,319	1,176,472	880,045
Typesetting Machines	176,048	249,430	3,347,956	3,089,140
Printing Presses	389,503	316,862	5,712,463	4,156,801
Agricultural Machinery and Implements	4,585,199	4,617,476	80,700,632	70,460,789
All Other Machinery and Parts	13,139,902	10,147,851	122,332,976	107,260,906
Total	$32,694,793	$29,436,903	$368,048,685	$331,815,960

Exports of Power-Driven Metal-Working Machinery

	November, 1926 No.	November, 1926 Value	October, 1926 No.	October, 1926 Value
Engine lathes	37	$96,849	34	$53,070
Turret lathes	20	65,152	11	21,059
Other lathes	40	33,850	29	45,965
Vertical boring mills and chucking machines	3	1,729	3	3,313
Thread-cutting and automatic screw machines	81	97,162	28	18,695
Knee and column-type milling machines	27	56,803	11	27,165
Other milling machines	11	16,959	38	52,669
Gear-cutting machines	14	8,724	15	17,380
Vertical drilling machines	34	22,182	15	11,450
Radial drilling machines	1	765	15	14,747
Sensitive drilling machines	9	4,304	5	1,906
Other drilling machines	24	26,156	31	21,962
Shapers and slotters	26	29,961	22	25,204
Planers	..	.....	..	.....
External cylindrical grinding machines	42	75,632	32	61,207
Internal grinding machines	34	40,787	12	26,565
Metal-working tool-sharpening machines	40	31,578	67	33,729
Total	443	$608,593	368	$436,086

Imports of Machinery into the United States

(By Value)

	November 1926	November 1925	Eleven Months Ended November 1926	Eleven Months Ended November 1925
Metal-working machine tools	$27,228	$37,010	$391,597	$347,772
Agricultural machinery and implements	335,112	183,506	4,675,682	2,871,448
Electrical machinery and apparatus	59,374	119,220	767,288	864,891
Other power-generating machinery	3,009	2,361	75,467	21,130
Other machinery	581,046	550,724	8,159,138	4,492,131
Vehicles, except agricultural	205,099	214,351	2,027,669	1,764,182
Total	$1,210,868	$1,107,172	$16,096,841	$10,361,555

small decreases in numerous other items. Shipments of combined harvesters and threshers showed a considerable increase, while a few other items showed small increases.

Canada was the largest buyer of railroad locomotives during November and the second largest purchaser during the 11 months ended November, taking locomotives to the value of $45,012 out of a total value of $47,412 in November, and to the value of $608,614 during the 11 months. Brazil was the heaviest buyer of locomotives during the 11 months, her purchases aggregating $1,339,115.

The United Kingdom led as the destination of greatest shipments of sewing machines, for both domestic and factory use, in November, taking 1297 valued at $77,734, while for the 11 months the United Kingdom took 17,549, valued at $979,066. Mexico was the largest buyer during the longer period, taking 40,085, valued at $1,389,240, and for the single month took 1694, valued at $40,085. Brazil took 1395, valued at $48,515, in November and 11,952, valued at $443,890, during the 11 months. Canada took 905, valued at $34,557, in November and 8856, valued at $394,344, during the 11 months.

United States Exports and Imports of Machinery

	Exports of Machinery	Imports of Machinery	Exports of Metal-Working Machinery
The year 1924...	$317,040,424	$9,711,618	$8,644,444
1925			
January	28,117,952	803,829	845,986
February	23,215,776	814,703	707,445
March	33,932,473	999,237	1,364,930
April	33,468,086	1,167,099	1,694,761
May	32,164,865	861,655	1,230,914
June	27,121,123	935,487	1,003,325
Fiscal year	325,578,294	10,404,337	14,011,404
July	32,320,533	905,872	1,188,069
August	38,768,823	747,912	1,308,372
September	30,719,342	956,250	989,379
October	31,271,007	996,557	905,826
November	30,084,814	876,113	1,007,376
December	37,933,511	1,448,316	1,155,660
The year 1925....	385,376,676	11,577,911	13,052,916
1926			
January	34,590,693	1,659,971	853,276
February	32,269,707	1,469,170	1,294,934
March	35,241,960	1,567,912	1,297,616
April	38,755,467	1,814,021	1,479,337
May	32,707,863	1,494,156	1,004,298
June	30,498,054	1,484,127	1,024,252
Fiscal year	398,306,436	15,413,144	16,046,267
July	34,123,992	1,327,874	1,318,556
August	32,459,844	1,453,909	1,326,443
September	36,901,003	1,432,378	1,145,406
October	27,965,148	1,247,115	1,069,343
November	32,694,793	1,210,868	1,274,446
Eleven months...	368,048,685	16,096,841	13,113,626

The United Kingdom was the heaviest buyer of American typewriters, both in November and the 11 months, taking 3195, valued at $175,718, and 47,609, valued at $2,610,778, respectively. France took 1686, valued at $104,459, in November and 32,739, valued at $1,734,106, during the 11 months. Typewriters to the number of 2085, valued at $110,761, were exported to Canada in November, while for the 11 months the number going to that country was 12,873, valued at $740,846. Germany took 1762 typewriters, valued at $61,284, in November, and 12,474, valued at $613,114 during the 11 months.

The United Kingdom took 64 printing presses, valued at $121,780, in November, and 597, valued at $2,059,203, during the 11 months. Canada took 50 printing presses, valued at $137,059, in November, and 294, valued at $1,038,275, during the 11 months.

The Nordberg Mfg. Co., Milwaukee, has started delivery of a battery of 47 powerful ore crusher units to the Symons Brothers Co., copper smelter, in Chile. The units weigh 25 tons each and are 10 ft. in diameter and 12 ft. high. They are of the disk type, motor driven, and are designed for pulverizing ore. Shipment is being made by rail to New York. Delivery will be completed about Jan. 15 from the Milwaukee works.

1926 TRADE ABOVE NORMAL

Inventories at Lowest Point in History, Says W. C. Carroll of Inland Steel Co.

"FROM the standpoint of the steel industry we have enjoyed during 1926 a volume of business which must be considered far above normal," said Walter C. Carroll, vice-president Inland Steel Co., Chicago, in a statement regarding prospects for 1927. "If we have a clean-cut idea of what normal business is, then have we had normal business during the past year, and may we expect abnormal business during 1927?

"Production figures which will be available in the near future will reveal that many old-time records have been broken. It will be found that consumption as well as production has proceeded at a record-breaking pace, and a careful analysis will show that steel in many of its forms is not only replacing other materials but is rapidly entering new fields.

"At the beginning of 1927 we find inventories at the lowest point in history, when the volume of business is taken into consideration. This is largely due to the excellent performance of the railroads. Freight cars, to a considerable extent, are taking the place of the consumers' warehouses as they travel between the steel works and points of consumption. Stocks of from 60 to 90 days' supply seem to be no longer necessary. Much working capital has therefore been released. The work of Herbert Hoover's department to bring about simplification of sizes and styles, and the consequent elimination of waste, deserves prominent mention.

Look to 1927 with Optimism

"It is generally in order, when attempting to look into the future, to mention certain important factors which have a direct bearing on sound business. Perhaps we have taken for granted the steadying influence of the Federal banking system. We would consider him a false prophet who now predicts a panic or even fears unreasonable inflation. There is nothing in the immediate future to indicate other than easy money. Railroad equipment has been steadily used during the past two or three years. Earnings have gradually increased but replacements have not kept pace with wear and tear. The new year therefore promises to be a most favorable one from the standpoint of purchases by railroad companies. The increasing use of automobile trucks and the continuation of the road building program are closely linked with the railroads and are a direct result of a sustained demand. The automotive industry has given evidence of unusual sanity; instalment buying of cars has been restricted to a more healthful basis; our enormous building program is to be continued, and while we may find a falling off in the number of smaller buildings, it is possible that the heavier types of construction will fully compensate.

"During the early years of big business in this country our periods of both depression and prosperity were disastrous because of the extremes to which business was carried in both directions and the duration of these two unhealthy conditions. In the steel business the peaks and valleys of recent years do not show such great extremes. The periods of recession are shorter, demand and production are on a gradually rising plane, and the industry is therefore proceeding on a more even keel. The sustained buying power of the wage earner has, of course, been due to great volume and steady employment. The conservative selling prices for steel products have enabled many projects to be carried forward. The much dreaded vicious cycle of past years has assumed a much happier aspect.

"But what is normal business? Is it not a satisfied state of mind due to those factors which make for good business, such as a substantial order book, fair selling prices and good prospects for the future? In other words, a state of business which is just a little better than had been anticipated? If this definition has been correctly framed, then our state of mind must be adjusted as a result of the gradually but steadily increasing demands of our great country, with the passing of each year."

Business Analysis and Forecast

BY DR. LEWIS H. HANEY

DIRECTOR, NEW YORK UNIVERSITY BUREAU OF BUSINESS RESEARCH

Favorable and Unfavorable Factors Affecting Business May Be Summarized as Follows:

Favorable Factors

1. Fairly prompt readjustment of production in basic industries, reducing the danger of serious over-production.
2. Greater stability in prices of basic commodities.
3. Large volume of retail trade.
4. Purchasing power of labor still large.
5. Strong financial position of leading companies.
6. Light mercantile inventories.

Unfavorable Factors

1. Decline in P-V Line.
2. Decline in building activity.
3. Decline in automobile production and sales.
4. Low farm prices and purchasing power.
5. Decline in employment and payrolls of factory labor.
6. Decline in new business enterprises and increased number of failures.
7. Money rates above the yield on bonds.
8. Large manufacturers' inventories.
9. Political uncertainties.

UNFAVORABLE factors are the more numerous and important. It is especially noteworthy that declines are in evidence at a season when in recent years rises have occurred. A further moderate recession in business is forecast.

AS the year ends there is a slightly declining trend in business. Nevertheless, divergent trends are shown in the first chart, which illustrates the movement of bank debits and of railroad freight traffic. In November bank debits (volume of checks drawn) were clearly lower, and the general trend has been irregularly downward throughout the year. Railroad tonnage, however, was large, considering the season. November car loadings numbered 4,657,000, against 5,216,000 in October, which is less than the usual seasonal decline.

This divergence is not to be explained by the effect of declining commodity prices on bank debits, as there has been little decline in the last few months. The explanation lies in the abnormal coal traffic of the railroads, which has carried the tonnage figures above the seasonal level. In the week of Dec. 11, it was only the coal loading which prevented car loadings in general from falling even below the figure for two years ago.

We consider that freight traffic in the last two months has not been representative of industrial conditions, and mostly represents the temporary prosperity of certain coal sections and carriers. The coal roads have shown large gains in earnings over a year ago, while the other carriers have been about equally divided between losses and gains, and have, on the whole, made a very spotty showing. It is believed that freight traffic will show a rather sharp decline in the near future, probably in the December figures.

The most significant fact illustrated by the chart is the large though irregular decline in bank debits, which have fallen from a secondary peak reached in August, when they were 138 per cent of the 1921-25

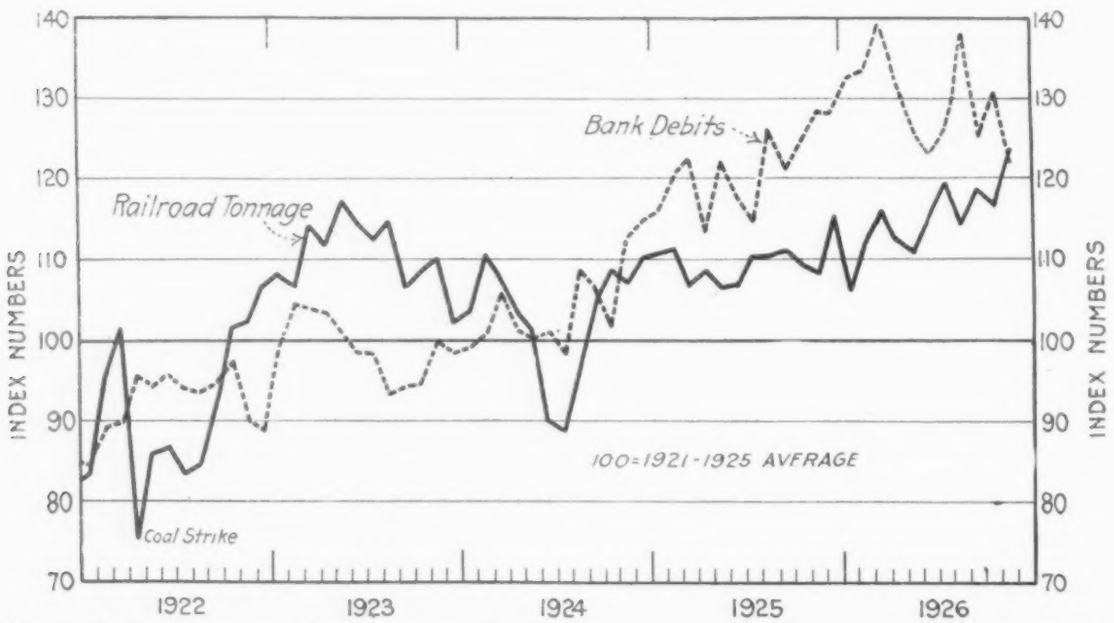


Fig. 1—Railroad Tonnage, Unusually Large for the Season, Has Depended on Enormous Coal Shipments to Maintain Its Bulk. Bank debits are falling sharply, indicating a downward trend from the business peak

In This Issue

Better use three factors in calculating foundry "overhead."—Instead of estimating general expense solely on molding cost, it is safer also to use core-making and cleaning costs.—Page 1816.

A further moderate recession in business is forecast.—Slight downward trend will likely continue, economist points out. Shrinkage is already shown by 16 per cent contraction in bank credits during last three months.—Page 1832.

We have bought more foreign iron and steel this year than in any time since 1903.—Over one million gross tons purchased from abroad in first 11 months of 1926. Exports amount to almost two million tons.—Page 1867.

Suggests the use of models in experimenting for improvement in efficiency of industrial furnaces.—Thurston medalist believes heat economies could be secured by study of principles of heat transfer.—Page 1829.

November Business Statistics show considerable gain in one industry, and losses in others.—Bookings of fabricated steel plate were 68 per cent of capacity; largest month since April, 1923.—Page 1869; bookings of steel castings amounted to 53 per cent of capacity. This was below October, but first 11 months of year show improvement over 1925.—Page 1869; output of malleable castings was almost 20 per cent below October and lowest month in two years.—Page 1820.

New stationary shearing table for steel mill use has two movable knives.—Cuts *upward* and is said to give very clean ends.—Page 1811.

Questions whether it is common for labor unions to aid in increasing industrial efficiency.—Speaker at A.S.M.E. meeting implies that cases are known where unions have endeavored to limit production.—Page 1818.

"Suggestion system" produces worthwhile results in B. & O. shops.—Workers have submitted 14,000 suggestions in past three years. Eighty per cent of them were accepted and adopted.—Page 1817.

Foundry must have flexible cost formula if it desires diversified work.—A rigid formula for figuring costs results automatically in the acceptance of a restricted class of work. If the market is limited, a cost system should be devised to permit accurate bidding on a wide range of work.—Page 1816.

"Discover" that amount of "consumer-income" affects national prosperity.—Authors of "Profit" advocate unimpeded distribution of earnings but overlook certain flaws in their theory.—Page 1819.

In most industries the five-day week will result in five-sixths the output of the six-day week.—With industry almost completely mechanized, curtailment of hours can do nothing but diminish output. What labor leaders want is a six-day pay check for five days of work.—Page 1840.

Exports of machinery well above last year's level, with mining and oil-well machinery showing largest gains.—Meanwhile, imports of machinery during first 11 months of year are already ahead of all 1925.—Page 1830.

Says year-end inventories are at lowest point in business history.—Chicago steel executive thinks railroad service is largely responsible for accompanying release of working capital and rapid turnover of stocks.—Page 1831.

Supreme Court decisions uphold constitutional rights of property.—Define reasonable rate of return on valuation, differentiate between tangible and intangible property and settle other controversial matters.—Page 1842.

British industry is failing to correct existing fatigue conditions of worker in stress of introducing new production methods.—London periodical praises work of Taylor in his early attempts to get better value out of human effort in interest of both laborer and employer.—Page 1841.

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Reviews, Forecasts and Statistics Next Week

OUR annual review number appears next week. It will take probably 130 or more pages to get in all the matter which is now being compiled for it. It will include reviews covering trends and tendencies in iron, steel, metals and metal-working machinery. Also, it will tell how much of different major forms of steel were produced in the year now drawing to a close and the amounts of each absorbed by consuming industries. It will contain forecasts not only of the industry broadly but of the branches taking most of the steel. It will discuss at length some changes taking place in marketing and distribution that are not yet broadly recognized.

Statistically, it will easily surpass all preceding annual numbers in both scope and number of charts and tables. In all respects, without attempting further to touch on its contents, it will be virtually the year book of the industry, a worthy product, we believe, of that institution of which we are proud, THE IRON AGE.

For News Summary See Reverse Side

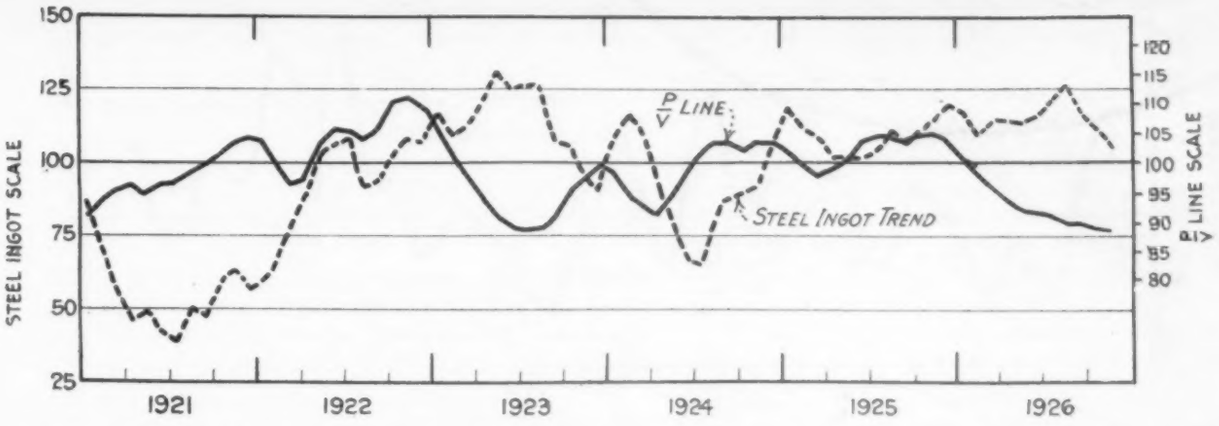

Fig. 2—For a Full Year the P-V Line Has Been Sagging. This Is in sharp contrast with every other year Since 1920, each showing some rise in the second half. This is the first autumn since 1923 that the trend of the steel ingot Curve has been downward. P-V represents the ratio of commodity prices to the physical volume of trade. It generally anticipates the trend of business by about five months

average, to 122 per cent in November. Last year at this time the trend was upward.

P-V Line Has Been Declining Throughout the Entire Year

ONE reason for the decline in bank debits appears in the steady sagging of the P-V Line. As shown in the second chart *there is no year-end rise in that barometer this time. Each year since* 1920 *the P-V Line has shown some rise in the second half, indicating a revival of demand for commodities. In* 1926, *however, there has been a steadily declining trend throughout the year.* This forecasts further moderate declines in business and probably in the output of steel ingots.

It is noteworthy that *this is the first autumn since* 1923 *that the trend of our adjusted curve of steel ingot production has shown such a decline as has occurred during the last three months.*

It seems doubtful that we will have a spurt in steel production in 1927 such as occurred early in 1926, or in 1924. If such a spurt were to develop it would be even less justified than the run-up that occurred in January and February, 1924. Probably the ingot output, allowing for seasonal conditions, will continue its declining trend, but more gradually.

Condition of Unfilled Orders and Scrap Prices Suggest a Decline

CONTRARY to our expectations, the average price of a group of steel stocks reached a new high in December. We think this was due, not to brighter prospects for steel earnings, but to melon prospects. The 40 per cent stock dividend declared by the United States Steel Corporation was at least partly responsible. The trend of earnings in the steel industry is at present downward, and our November index of the sales of finished steel will show a fairly sharp decline,

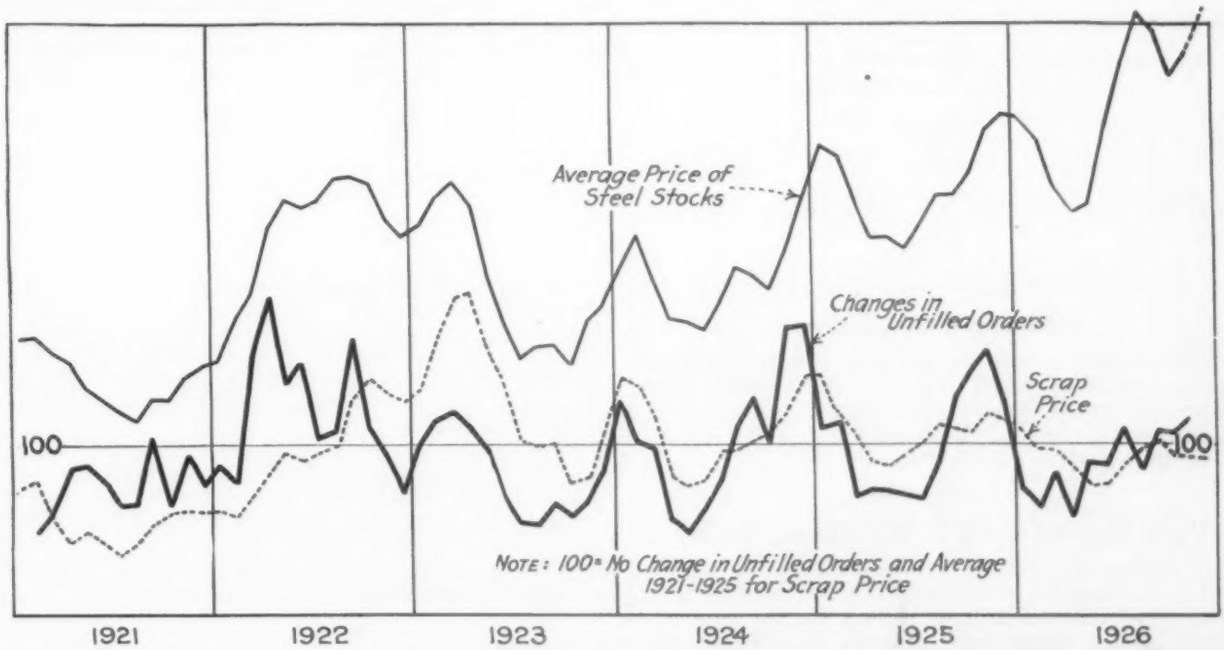

Fig. 3—Steel Stock Prices Have Reached a New High in December, Due Doubtless to "Melon" Prospects. Unfilled orders, showing a gain in November, do not fairly represent business conditions. Scrap prices are sagging and unfilled orders may follow suit

Schedule of the next installments of the ***Business Analysis and Forecast,*** *by Dr. Lewis H. Haney, Director New York University Bureau of Business Research, follows:* ***Jan. 13****—Activity in Steel-Consuming Industries;* ***Jan. 20****—Position of Iron and Steel Producers;* ***Jan. 27****—General Business Outlook.*

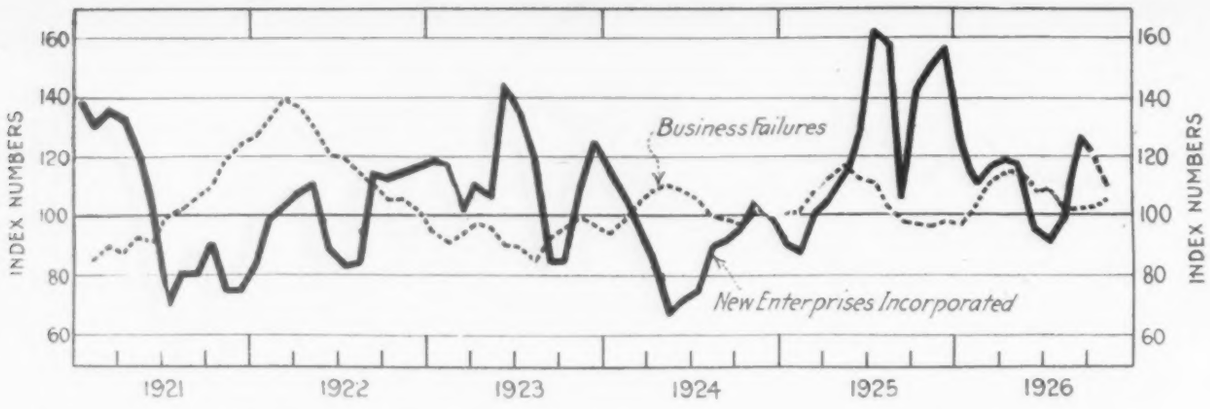

Fig. 4—Business Failures Have Been Above Normal Since Early in the Year. New business enterprises are declining sharply from a high level in September. Both curves are plotted as three-month moving averages, to avoid excessive local irregularities

due to lower sales of sheets, structural steel and steel castings.

This fact casts doubt on the November rise in unfilled orders. The rise was due in part to seasonal rail business, which is generally admitted to have little significance, and in part to decreased shipments. In any case, it will be noted that the gain in our unfilled orders barometer was much smaller than in any one of the last three years. We frankly doubt the significance of the move.

Scrap Price Curve Shows Sagging Trend

The curve of steel scrap prices for the most part seems to furnish a sort of normal line for the curve of the rate of change in unfilled orders, the latter generally playing around the former. As the scrap price curve shows a slightly sagging trend, there is some presumption that the unfilled orders curve will fall back toward it. Thus these barometers leave us uncertain at the present juncture. We think that the average price of steel stocks is high, considering the earnings prospects, and that, now that the steel melon has been cut, there will be a downward readjustment early next year.

Increasing Business Failures and a Lower Volume of New Business Enterprises

BUSINESS failures have been rather numerous. In November they numbered 1830, which is more than the usual seasonal increase for the first winter month. It compares with 1672 failures a year ago. More significant still is the fact that failures have shown a rising trend since July, and the number in the three months ended with November is larger than in any similar period since 1922.

Business failures, however, have little barometric value. The only conclusion we draw is that they reflect the existing unusually keen competition in business, coupled with low prices and poor profits.

Both Number and Capital Lower

Another fact of importance is the concurrent decline in new business enterprises, both in number and in total capitalization. The situation closely resembles that in early 1924. Rising volume of failures and declining new enterprises usually occur after a business peak and in the course of the following readjustment. This generalization fits the present state of facts fairly well. It is believed that we are in process of readjustment—not one which has been preceded by violent general excesses in business, but one which has been entered gradually on account of above-normal production, accompanied by declining commodity price levels.

New enterprises are a very sensitive though erratic index of business trends. They reflect business sentiment and often forecast building activity. As shown in the fourth chart, the curve of new enterprises, after a little recovery between July and October, turned downward sharply in November.

The foregoing facts tend to confirm our opinion that the trend of building activity will continue downward, and is pretty conclusive evidence as to the lack of real optimism concerning the business situation during the next six months.

Bethlehem Sparrows Point Plant Nearing Completion

Twelve additions to the tin plate mills of the Bethlehem Steel Corporation's Sparrows Point plant, to be completed within the next three months, will give the works a total of 48 mills, making it one of the largest tin plate plants in the country.

Year End Activity in Mahoning Valley

YOUNGSTOWN, Dec. 27.—President James A. Campbell of the Youngstown Sheet & Tube Co. predicts that 1927 will be almost as good a year for the steel industry as the record year of 1926. He states, however, that the industry is earning only 5 per cent on its investment, as compared with 20 to 30 per cent in some other manufacturing lines. He believes new buying will start about mid-January and will gather strength as the first quarter progresses.

The cost of new construction is so high he doubts whether many companies are justified in proceeding with new capacity. The sheet and tube company's principal expansion program next year will be in the addition of a $5,000,000 by-product coke plant at its South Chicago works.

Rolling mill suspensions for this week were increased by a fire which destroyed the warehouse and stock buildings of the Thomas Sheet Steel Co., at Niles, Ohio, entailing a loss placed at upward of $250,000. A large tonnage of finished steel was destroyed, piling up the loss, covered by insurance. The company's plant is temporarily idle.

The Newton Steel Co. and the Mahoning Valley Steel Co. are completely inactive for the week, for repairs. Of 127 sheet mills, only 50 are scheduled. Most of the Valley properties, except the Trumbull Steel Co., will operate over New Year's day.

Of 53 independent open-hearth furnaces, 30 were scheduled, a gain of two over the preceding week.

The St. Louis Superintendents' and Foremen's Club of the National Metal Trades Association elected the following officers at a dinner meeting held at the Buckingham Hotel, St. Louis, Dec. 14: President, H. H. Williams, Quick Meal Stove Co.; vice-president, Henry Peterson, A. Leschen & Sons Rope Co.; recording secretary, F. J. Feldhaus, Heine Boiler Co.; treasurer, Arthur Goerisch, C. S. Lewis & Co.; financial secretary, L. W. Hunthausen, Stupp Brothers Bridge & Iron Co.

HOPEFUL FOR 1927

Expressions of Business Opinion All Look for Good Volume But Costs Need Watching

Members of the National Association of Manufacturers, including several of the directors, responded to the association's request for an expression of opinion on the business outlook for 1927, based upon their experience in 1926. Among the statements were the following, briefly extracted:

D. M. Weir, vice-president Weirton Steel Co., Weirton, W. Va., said: "While there is some dropping off in the volume of business, except in such lines as are always benefited through holiday distribution, I see no reason to expect anything except satisfactory volume of trade over the ensuing six months.

"The fundamentals that always go to make prosperity are certainly in evidence now, namely: an ample supply of money at reasonable rates, large individual consumption, low prices on commodities and low inventories. My opinion is that inventories generally, at the close of 1926, in comparison with the daily consumption of the country, will be on a lower basis than has been the case for a number of years. I do feel, however, that 1927 will be one of great competition in business, because our productive capacity is very large, and only those concerns will prosper who are able to carry along efficiently and with sound business judgment.

"While individual requirements are large, yet buyers are discriminating, and a tendency toward higher prices will bring a reaction in the way of smaller volume. Therefore, to continue the prosperity that we have enjoyed for the past several years, efficiency both individual and collective must be the slogan of business."

William C. Coleman, president Bucyrus Co., South Milwaukee, Wis., said: "The Secretary of the Treasury, the Secretary of Commerce and many other eminent authorities have attested to the great prosperity of the country prevailing in 1926 and have indicated that a continuance of this condition may be expected throughout 1927.

"If these forecasts are correct, and I see no particular reason to doubt them, it behooves us to take stock of the situation and to plan to do those things which will tend to promote a continued high rate of production with its resultant prosperity, rather than to assume that prosperity is assured and allow ourselves to drift into a state where it will be seriously menaced.

"The prosperity of the past year may be measured by the relatively large earnings. This has in turn depended upon a number of factors—among them, a large volume of production and high wages (as measured by past standards). But accompanying them have been increasing costs of marketing products and narrowing margins of profit.

"If this brief analysis is correct, and we wish our prosperous condition to continue, what should be our obvious course?

"1. An intensive study to reduce costs by every possible means. If this can be done we will be in a position to tide over a period of reduced production—if that should come—and still maintain margins of profits.

"2. Maintenance of present wage rates and prices of products.

"If volume continues at the high rate of 1926, reduced costs would lead to reduced prices, thus further stimulating business. A history of the course of business activity would probably show that more periods of prosperity were stifled by flagrant opportunism than by anything else. If this is true, why not avoid it?"

P. O. Geier, president Cincinnati Grinders, Inc., Cincinnati, said: "The volume of manufacturing activity for 1927 should be approximately that of 1926. Some industries will probably show a decrease of activity, among them the automobile industry, although even here unforeseen conditions may make next year's totals equal this year's output.

"The railroads, due to their excellent financial condition, and also due to the fact that a heavy strain has been put upon their present equipment during the past three years, will undoubtedly place a considerable amount of orders for equipment. Industrial machinery should be active.

"Nineteen twenty-seven will be a year in which costs must be still further reduced. Costs of distribution and selling will be carefully analyzed, but the major saving must still be looked for in the cost of production. Certain types of labor-saving devices and tools can profitably be installed, no matter what may be the period of the business cycle. Manufacturers of equipment of this nature may look for excellent business.

"Those who concentrate their sales efforts on the fields in which the greatest opportunities lie for increasing production and lowering costs will profit accordingly. General business should produce a satisfactory volume of orders—but these will undoubtedly be more difficult to obtain and will require greater efficiency in shop and office alike."

Fayette R. Plumb, president Fayette R. Plumb, Philadelphia, said: "I can see no reason why 1927 should not be a pretty close repetition of 1926. They tell us that building activities will slide off, and, of course, we know that the cotton growers will feel poor. But the cotton growers' loss will be the gain of the cotton user and, if building slackens off, something else will speed up.

"The greatest menace to the present situation seems to me to lie in the extension of their functions by municipal governments and the extravagance of municipal and county governmental agencies."

Sharp Reduction in Automobile Production in November

Production of automobiles in the United States in November aggregated 219,479 passenger cars and 36,334 trucks, a total of 255,813 vehicles. Both figures represented a sharp reduction from the preceding months of the year, the November total being the smallest since that of August, 1925, when the Ford Motor Co. was changing its model and lost several days of production. In trucks the November figure was the smallest since January. The immediate comparison is with October, when 289,547 passenger cars and 42,890 trucks were produced. The high figure of the year came in April in both classes, with 383,907 passenger cars and 50,314 trucks. In November last year production aggregated 328,694 passenger cars and 37,811 trucks.

Notwithstanding the sharp falling off in November, which followed a smaller recession in October, production for the 11 months of the year has been the highest ever recorded, and has been higher than the full 12 months of any year, except 1925. In 11 months there have been produced in the United States 3,627,589 passenger cars and 465,265 trucks. This compares with 3,417,847 passenger cars in the 11 months of 1925 and 3,696,490 cars in the entire year. It compares also with 444,639 trucks in 11 months last year and with 478,396 trucks in the 12 months.

Shifting Balances of Trade

United States imports from the (British) Straits Settlements in the first nine months of 1926 amounted to $311,562,000, mostly tin and rubber, against American exports of only $9,838,000 to that Malay colony. That forms the largest "adverse" balance of trade of the year. Japan comes next, with silk, tea and other shipments aggregating $288,661,000, against $174,696,000 of American produce sent her. Brazil is the only other country with more than $100,000,000 balance against us, her coffee and rubber and other products having accounted for $169,721,000, against $68,571,000.

Great Britain bought $659,244,000 from us, and sold us only $282,619,000. Canada bought $553,913,000 and sent us $343,597,000. No other country reached $100,000,000 in excess of purchases over sales.

BLOOMING MILL PRACTICE

Development of Two-High Reversing Mills in Contrast with Three-High Mills

BY GEORGE A. V. RUSSELL*

SUCCESSFUL employment of the reversing blooming mill is stated by the author to be largely responsible for the relative cheapness of structural steel. This type of blooming mill is almost universal in Europe, where the three-high mill has never attained any large share of favor. The enormous demand for structural steel during the war greatly stimulated development in mill practice. The author chooses a moment when progress seems to have slackened temporarily to present a general résumé of current practice.

While the literature of the subject is extensive, no one comprehensive account seems to be available. The paper begins by considering the fundamental phenomena of the rolling process. The author agrees with other writers in considering this process as essentially compressive in character. Wedge-shaped prisms are formed under the areas of contact between the piece and the rolls. Such points as the temperature range of the steel during rolling, and calculation of the energy expanded in deforming metal, are dealt with fully.

What Occurs Inside the Ingot

Metallurgical significance of the cogging operation, with particular reference to its effect on the structure of the steel, is taken up. During the first few passes the principal effort of rolling will be to close up existing voids and to knit together the inner regions of the ingot. Welding occurs whenever the condition of the crystal facets thus pressed together permits.

Under drafting practice, the author considers the economy of various sizes of ingots and compares European and American rolling practice as regards sizes and character of rolls. Following a consideration of the torque diagram and speed curve for a normal cycle of operation in a modern heavy blooming mill, the relative efficiencies and desirable characteristics of steam and electrically-driven rolling mill power units are dealt with. The reversing steam engine, compounding and control gears are discussed fully. Particulars are given of representative electric equipment for blooming mills, for which sluggishness in acceleration seems to be the main difficulty.

Design of Mill and Appurtenances

Technical and authoritative discussion follows on the design of the mill train from the point of view of mechanism and stresses. The auxiliary plant for transportation, manipulation, cutting up and disposition of the steel, while at the mill, receives consideration. Shears for cutting hot blooms, slabs and billets are classified according to the direction in which the moving blades operate. Hydraulic steam and electric drives for shears are described and compared.

Comprehensive treatment of the layout of the blooming mill in relation to the rest of the steel plant is given and American, British and Continental practice are described and compared. Valuable information is provided with regard to many typical plants.

[Several specific portions of Mr. Russell's paper will be published later.—Editor.]

*Brightside Foundry & Engineering Co., Ltd., Sheffield, England. This is a brief abstract of a voluminous paper before the American Society of Mechanical Engineers, presented Dec. 16 at a sectional meeting in Cleveland. The paper as preprinted covers 116 pages, with 44 figures. Mr. Russell is manager of the engineering department of the Brightside company, with control of design, manufacture and sales.

More Locomotives in 1926

Railroad locomotives shipped from the principal manufacturing plants in November are reported by the Department of Commerce at 128, compared with 151 in October and with 106 in November, 1925. For the eleven months a gain of 40 per cent has been registered over 1925, with 1565 this year and 1112 last year.

Of November shipments 109 steam and 15 electric are for domestic service and 3 steam and 1 electric for export. For eleven months the American roads received 1205 steam and 160 electric locomotives, against 687 steam and 126 electric units last year.

Exports in 1925 were much heavier than in 1926, with 299 of the two classes in eleven months, compared with 200 this year. In November alone 46 steam locomotives for export were shipped in 1925.

Unfilled orders at the end of November called for 517 units, of which 391 steam and 27 electric locomotives are for domestic use and 84 and 15 for export.

Railroads Criticized for Manufacturing

Railroads are diverting some of their energies and resources to the development of manufacturing facilities, with the result that their cost of operation is increased, according to a memorandum prepared by the American Railway Car Institute and laid before the presidents of many of the important carriers.

Since war-time operation of the railroads by the United States Government ceased and they were returned to private management, it is said, there has been an increasing tendency on the part of the roads to do more and more building and rebuilding of their own equipment. This situation is opposed strenuously by leading equipment manufacturers.

The Pennsylvania, the Louisville & Nashville and the Philadelphia & Reading are active in the building of their own locomotives. Of 300 locomotives recently ordered by the Pennsylvania, it is said, one-third are to be built in the company's own shops.

Some of the railroads contend that because their shops are established they can do the work more cheaply than the equipment companies can do it and that they do not have the same overhead costs. The equipment manufacturers assert that they do not recognize all their overhead in estimating expenses.

So highly competitive has the car-building business become, the equipment men say, that the railroads have been able at times to get their new equipment at actual cost. After a score of years, they argue, the general trend of prosperity has enabled the railroads to earn something for their stockholders, and in manufacturing, instead of confining themselves to transportation, they will retard rather than advance this prosperity.

Blake & Johnson Co. Sells Its Machinery Division

The Blake & Johnson Co., Waterbury, Conn., announces the sale of its machinery division to the Torrington Mfg. Co., Torrington, Conn., effective Jan. 1.

For many years the Blake & Johnson Co. has been well known for the manufacture of cold rolling mills, steel flat wire equipment and auxiliary machinery for sheet and strip mills. The Torrington Mfg. Co. builds similar equipment, having specialized in the nonferrous field. It also makes machinery for the manufacture of wire, rods, tubes and cables and also some equipment for sheets and strips.

In the announcement John P. Elton, president of the Blake & Johnson Co., points out that the "combination is logical, and the step has been taken in the knowledge that it will result in a better organization, improved manufacturing facilities, an extended list of products and a more complete service."

The entire sales force of the machinery division of the Blake & Johnson Co. will join the Torrington Mfg. Co. Wadsworth Doster, who has been manager of the Blake & Johnson machinery division and who previously was associated with the Torrington Mfg. Co., will have charge of sales for the latter company.

AUSTRIAN TRADE DEPRESSED

Polish Competition Severe—Wages Have Increased and Prices Are Soft

VIENNA, AUSTRIA, Dec. 10.—Throughout the past year the iron and steel production has declined from quarter to quarter. Domestic business has been slack and the building trades have been depressed as a result of the shortage of capital. Polish competition has been severe, the Polish producers evidently being in part actuated by a desire to increase their production to a high point, so as to obtain the largest possible quota, in the event they join the International Steel Cartel. In addition to the depressed situation in iron and steel the iron ore production has declined during the year.

In the first quarter of the year iron ore output was 326,566 metric tons, dropping to 289,668 tons in the second quarter and to 246,709 tons in the third. Pig iron production also registered a decline in the first three quarters of the year, dropping from 108,174 metric tons in the first quarter to 76,874 tons in the second and to 69,351 tons in the third quarter. Steel output, from 137,601 tons in the first quarter declined to 126,155 tons in the second and to 107,817 tons in the third quarter.

Domestic prices have in some instances advanced, but the total increase in these cases has not been equivalent to the higher import duties, which became effective in August. Wages, throughout the metal working industries, have increased during the year. Prices are higher on billets, bars and wire rods than in the early months of the year, but pig iron shows a decline and structural steel prices are slightly lower. Quotations on heavy sheets have been fairly steady.

Forecasts for 1927

Forecasts of industry and commerce in 1927, collected by the Associated Press, were made public this week. They include the following:

Elbert H. Gary, chairman, United States Steel Corporation.—"Any man well posted will say that general business conditions in 1926 have been extraordinarily good. Likewise he could, with justice, say the opportunities for success in business in this country have been better than they have ever been before. We are rich in resources, including cash balances in the banks. Our banking facilities have been improving year by year ever since the Federal Reserve was established. This is likely to continue.

"Labor conditions are unusually good. There is little real disagreement or dissatisfaction to be found in industrial circles.

"As to the future, no one can be certain as to what is going to happen. Many things may occur to change the business situation for the worse at any time. Some of them may be preventable. But with the opportunities as outlined, there is no reason why prosperity during 1927 should be seriously interrupted. There is nothing in sight to indicate that it will be. If business shall be seriously diminished during the coming year it shall be the fault of ourselves, and not the fault of natural conditions or lack of fair treatment by the national Administration."

Charles M. Schwab, chairman of the board of the Bethlehem Steel Corporation.—"At no time in history have the people of the entire nation so enjoyed the prosperity prevalent in the United States today. At no time have people dreamed of the universal use of luxuries which we accept as our birthright. Our material prosperity is astounding; so remarkable, in fact, that business men are coming from all parts of the world to study our methods.

"We still have many problems before us. Our very prosperity makes foreign manufacturers cast envious eyes at our markets. To maintain our markets and our present high wages with reasonable profits for manufacturers we must realize efficiency and economies upon a progressive scale, not merely in production but in marketing methods as well.

"Both in industry and in agriculture there must be cooperation among the factors involved to an extent never before considered necessary or even desirable. Farming must be conceived on a more scientific basis. There must be greater integration of agricultural producing units. We must apply to our fields the methods of large scale production which have been found successful in our factories. Waste in marketing must be minimized on the farm as well as in industry.

"These things can and will be done through the cooperation of heads of industries, farmers, bankers, Wall Street men and ranchers. We have the greatest country in the world, and with intelligent effort, a feeling of humility and with faith in one another nothing is beyond the power of achievement."

Alfred P. Sloan, Jr., president, General Motors Corporation.—"There is reason to expect that 1927 will be another good year for the automobile industry—perhaps not so good as 1926, but a satisfactory year. It must be recognized that the volume of the replacement automobile business is increasing rapidly and that the overseas demand is steadily expanding, and that additional volume from these sources in 1927 will go far toward offsetting any reduction of new user buying in this country.

"Although there is some uncertainty as to what the level of general business activity will be next year, there appears to be little likelihood that any drastic change will take place, and that at worst nothing more than a moderate slowing down need be anticipated."

Apprenticeship Plan Being Adopted by Philadelphia Schools

The metalworking industries of Philadelphia, under the supervision of the Metal Manufacturers' Association, have agreed to place a number of apprentices in their shops in cooperation with the public schools of Philadelphia. These boys will be indentured by the company for which they work and the company will assume the responsibility of giving them an all-around training in the elements of their respective trades. Related instruction will be given to these boys in the schools, four hours each Saturday morning to be devoted to class room work. The school work will include such subjects as mathematics, trade sciences, English and economics. Apprentices will be paid by the employers for the time spent in gaining their instruction. When small or highly specialized plants cannot furnish complete training, the boys will be rotated through a number of plants in order to obtain a thorough mechanical education.

On the satisfactory completion of the course, both in shop and school, the boys will be given a certificate signed by the employing firm, the Philadelphia Board of Education and the Metal Manufacturers' Association, each of which thus sponsors the thoroughness of the training given. Applicants must be not less than 16 years of age and must possess the equivalent of a grammar school education and must be physically and mentally qualified for the work to be undertaken. Prizes will be awarded for superior achievement.

Short Course for Foundrymen at University of Wisconsin

The University of Wisconsin announces that a short course for foundry superintendents, managers, foremen, molders, chemists and others actively engaged in foundry work will be held by the College of Engineering of that institution Feb. 1, 2, 3 and 4. New metallurgical discoveries and researches affecting foundry practice will be covered as well as fundamental principles of foundry work. The various subject headings are: Cupola practice, molding and core sands, foundry costs, management and accounting, non-ferrous metals, malleable castings, steel castings. The round table method will be employed in presenting the subject matter. Visits will be made to several foundries in the vicinity of Madison, Wis. Prof. E. R. Shorey, College of Engineering, University of Wisconsin, has charge of registrations.

ESTABLISHED 1855

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Five-Day Week with Variations

WILLIAM GREEN continues to harp on the five-day week as the objective of organized labor and he is assisted enormously by some industrial managements. In seeking publicity or popular approval of their making a virtue out of a necessity, these latter come forward with assertions that they have adopted this plan of operation and have found exactly the benefit that Mr. Green alleges, i.e., an increase of output in the shorter time. Some of these assertions are quite naive.

Thus, a certain paint manufacturer says that previous to November his plant had been operating 24 hours a day, seven days a week. This schedule forced frequent complete shutdowns to permit of plant repairs. Beginning Nov. 1, the management decided to try the five-day (24 hours a day) week, in belief that repairs could be effected Saturdays and Sundays without curtailing production. Production in November declined but 7 per cent from the October figure, while saving in operating cost was 20 per cent.

Of course, this producer was not adopting the five-day principle at all, but was simply regularizing his operation, especially in respect to plant maintenance, which obviously is a part of the process of production.

Likewise, the business that is overbuilt and overmanned and is able to operate only on part time does not adopt the five-day principle any more than does the unionized bituminous coal mining industry that is able to function only a few days per week.

The output of the blast furnace, the fabric-weaving loom, the sulphuric acid system, and practically all of our mechanized plant is the product of size, design, and hours; and curtailment of hours can have the effect only of diminishing output. The labor leaders know this well enough and also know that it has nothing to do with their objective of a six-day pay check for five days of work.

IT seems strange that difficulties beset the standardizing of electric motor frame dimensions. The electrical industry has been looked on as one which early adopted standardization and was assumed still to be taking the initiative, where it was interested, in the broader and more vigorous movement which was ushered in under the inspiration of Secretary of Commerce Hoover. In the recent meeting in New York under the auspices of the American Engineering Standards Committee, however, efforts to establish such details as schedules of bolt hole sizes, shaft diameters, shaft heights and spacing of bolt holes struck a snag. Large groups of motor users, among them machine tool builders and makers of machinery directly driven by electricity, ask for some agreement. They certainly have no desire to hamper invention and improvement. They probably believe this need not happen, but that there must be a commercial consideration of the problem along with the scientific.

Backward and Forward Industries

ALL time is seasonable for making appraisals of our progress—or lack of progress—but at this time of year more interest can be aroused. In the ordinary talk of the day there is a great tendency to sum up achievements as being the general product of the country, when useful enlightenment would come if we differentiated between the forward and backward industries. For instance, in the farmer with his "flivver" we see the two extremes. How unattainable that flivver would be if the production methods were as inefficient as those of the farmer!

We take too much for granted. The conspicuous cases of efficiency are not accidents and the cases of inefficiency are not necessary. The steel industry is very efficient, but it does not let it go at that. It is continually striving for more efficiency. The methods of today were inconceivable in the old days of rolling iron, and it is only about a third of a century ago that the general supplanting of wrought iron by steel was taking place. The progress is not due to the accident of steel being easier to roll than iron. If there were no steel we should be making wrought iron much better than in the old days.

It is false and very harmful to assume that the different degrees of success attained in different industries are due to differences in the physical circumstances, that it is simply a case of hard luck in

certain industries in which conditions do not permit progress.

There are wide differences in methods of production and distribution in different commodities. One with any degree of instinct can pick out cases of extremes in retail stores. There are 10-cent articles that look much harder to make and distribute than 50-cent articles.

An easy way out of facing this issue has been to assume that some lines of activity are fitted for mass production and others are not. This country is so large that practically everything lends itself to mass production. Again the steel industry furnishes an illustration. It is thought of as "a tonnage proposition" because in the course of a year it distributes 30,000,000 to 35,000,000 gross tons of merchantable products. But there are literally hundreds of thousands of forms, shapes and sizes of things made by the steel industry. In the single class known as "wire products" there are tens of thousands. Yet steel is an efficient and progressive industry.

Contrast with this farm products, the greatest single group of all this country's products, yet generally speaking involving the least variety. There is not mass production and the only reply can be simply that "the farmers don't do it that way." Why not? Yet there is no single subject more talked of today than the poor position of the farmer. He is commiserated because he cannot afford to buy things that are produced with dozens of times more efficiency than is displayed in farming methods, and priced accordingly.

What this country needs is less loose talk about our efficiency in general results and more appraisal of the varying degrees of efficiency in our different lines of activity. What some industries have done other industries can do if they devote enough brains and energy to their problems.

British Ideas of Industrial Fatigue

IN a leading editorial which reviews research work done of late in Great Britain in industrial fatigue, *Engineering*, London, sets forth very clearly that a fundamental factor in the study of this problem is a widespread condition of wasted human effort in British manufacturing. The inference is that greater thought is being given to getting a much higher rate of production per man-unit, without imposing undue fatigue, than to relieving any present tendency to impose too great a physical burden upon men, women and children employed in industry.

The article quotes M. A. Lagos, addressing the British Section of the Société des Ingénieurs Civils de France, when he suggested the contrast between the care with which human effort is utilized in sporting exertions and the extravagance with which it is wasted in industry. The economy of effort in each case he measured by the ratio of the effort to the result produced; to the distance covered by the runner and the objects produced by the workman. He made rough calculations of the performance of "the amateurs of faineant industry," which may be translated broadly as indolent workers, in comparison with the daily activities of ordinary citizens, and found as against an ordinary man's speed of 3.2 miles per hour in walking and 11.5 miles per hour on a bicycle, their hourly output would have corresponded to only three-fourths mile on foot and three miles on a bicycle. The editorial says:

> Some part of this extravagance arises from deliberate shirking of work, whether through the influence of an economic fallacy or a cultivated taste for a leisurely life. There are, however, large numbers of men whose production falls short of what it might be, not through their own slackness, but because their energy is not used to best advantage. Today, when the country's income is far less than it requires, and it can afford no avoidable extravagance, this waste is a matter of grave consequence to national well-being. Familiar circumstances, which it would be needless to recite on this occasion, make it impossible for industries to maintain, let alone to improve, their standard of wages or living by increasing their selling prices. The margin has to come out of their costs, and the largest item of their costs, counting what enters into materials purchased as well as into the goods made, is the human effort employed in manufacture. Yet very literally there is no item of cost on the reduction of which the industries concerned seem to have spent so little thought.

The writer reviews the work done years ago in the United States "when Taylor and a very small school of followers started investigations on the floor of the workshop into what could be done to get better value out of the human effort, in the joint interests of those who exerted it and those for whom it was made; and when the result of inquiries of that kind are being considered, it is well to remember that even at that date the American was by no means a contemptible workman." Taylor and his fellows showed how the worker could increase his production in a manner undreamed of before. To quote further:

> In those days the influence of American trade unions was of the restrictive type with which we in this country are very familiar, and Taylor's methods were received with a good deal of opposition in the shops where personal influence was not available to induce men to try them for themselves. Over here for a long time the matter was not thought worth discussing, and even of late years some experienced manufacturers have expressed the opinion that nothing was worth doing in the investigation of industrial fatigue, because nowadays men did not work hard enough to know what fatigue was. On the whole, however, there is reason to think that such views do not represent what is felt generally by those who have thought seriously on the subject. The country, it is recognized, cannot hope to maintain or improve its position unless it makes better use of its energy and time.

All of which goes to indicate that the uppermost thought is not to correct existing fatigue, but to find ways of increasing production without imposing undue fatigue. The recommendation is that some one "with the indispensable range of practical experience make an intensive study on the spot of what really has been the outcome of Taylor's work."

The methods evolved by Taylor and others in securing maximum production without imposing increased load of effort upon the worker have come to

be so generally adopted in this country as to be taken as a matter of course. They constitute standard practice. There has been none of the let-down which the British writer seems to infer, but rather an adaptation to practical, every-day needs. Coupled with it as a stimulating cooperating of effort is the constantly increasing substitution of piece work for hourly wage. British engineers and physiologists, who seem to be working hand in hand in their industrial fatigue research, could, of course, learn much worth adapting to their home industries. In fact, they have already learned a good deal over here, including the evident truth that efficient manufacturing methods constitute one of the most potent correctives of industrial fatigue.

Supreme Court on Valuation

RECENT Supreme Court decisions in the cases of the Indianapolis Water Co. and the Consolidated Gas Co. are momentous. Following a long line of decisions in many cases to the same effect by lower courts, the Supreme Court has finally written a Magna Charta of property rights. Public utility companies may be under the control of Congress and the States, but none of the latter or their agencies may deprive such companies, or any other, of an adequate return upon full present value of their tangible and intangible properties. And in respect to adequacy of return it is plainly said that a reasonable rate is not less than 7 per cent. These decisions are momentous in their upholding of the constitutional rights of property, but great as is their confirmation in that respect they are even more sweeping in their definition of numerous controversial matters in practical economics, and as follows:

1. *A reasonable rate of return on valuation is not less than 7 per cent.* Congress has fixed 5¾ per cent for the railroads, and tax gathering agencies, Federal and State, have prescribed 6 per cent and as low as 5 per cent as bases for valuation, even of mines.

2. *Property may be both tangible and intangible.* To all socialistic economists the very term "intangible wealth" is anathema. Among orthodox economists some do not recognize it; others do. Yet almost every commercial valuation has something for intangible wealth in it. There is now the highest judicial recognition of this.

3. *Physical property of public utilities must be valued at cost of replacement.* Not at original cost, or original cost less depreciation, or at book reckoning, or in any other way than the estimated cost of reproduction of an equivalent plant under existing conditions. In free industry valuation is a capitalization of expected earning capacity, but in the instance of public utilities whose earnings are controlled by the State they must necessarily be a function of a valuation. The two conditions are just the opposite, like the reversible reactions of chemistry.

4. *Averaged prices of the past are not inherently any guide as to the future.* There must be an honest and intelligent forecast as to probable price and wage levels in the immediate future. Many taxing bodies have arbitrarily acted according to the principle of a 10-year or 20-year past period and have refused to listen to arguments of engineers and economists to the contrary. The Supreme Court now indorses the contention of the latter. Antedating averages are of use only in helping to form opinion as to the future. If adopted, the meaning is that no change of conditions is expected. If there be honest and intelligent opinion in respect to a definite upward or downward trend, such must prevail as a valuation factor. Bureaucratic denial of this principle has produced some great injustices in the past. Among other things this exposes the nonsense of Congress in prescribing retrospective property valuations as of Mar. 1, 1913.

5. *Depreciation is to be actually estimated, not theoretically calculated.* This is to say that an old property that has been thoroughly maintained is not subject to any deduction for depreciation, much less to a straight-line writing-off on account of age alone. This also is an upholding of engineering, rather than academic, contention. This refers especially, of course, to public utility property and is not to imply that in free industry a plant maintained with pristine perfection may not lose all of its value by obsolescence.

The establishment of these principles will be of vast importance in engineering-economic jurisprudence. Much of the ruling of bureaucracy in Federal and State assessments is now, by implication, declared to have been wrong. Some of those cases are now by-gones, but some in the Bureau of Internal Revenue may be reopened.

It is in respect to public utility companies, however, that these decisions are most immediately pertinent. Perhaps they will control the whole subject of railroad valuation and return, and certainly they will give the valuation department of the Interstate Commerce Commission much upon which to reflect. The late Senator La Follette had the idea that the steam railroads of the United States were worth about 12 billion dollars. The Interstate Commerce Commission several years ago adopted 18.9 billion as a tentative valuation. At the same time the railroad companies themselves thought their property was worth about 25 billion in terms of 1913 dollars. In current dollars that would mean 35 to 40 billions, and according to the Supreme Court there should be a return of at least 7 per cent on that, not merely 5¾ per cent as Congress has prescribed. Congress has the constitutional right to regulate interstate commerce, but not to confiscate any property directly or indirectly.

PRONOUNCED increase is reported in the capacity of German iron blast furnaces. According to *Stahl und Eisen*, with 237 serviceable furnaces in 1920 the daily capacity was 35,997 tons, or 152 tons per furnace. In December, 1925, the daily capacity of 211 furnaces was 47,820 tons or 226 tons per furnace, and in October, 1926, the 210 furnaces, with a total of 52,135 tons a day, had an average of 248 tons per furnace. This is an increase of 60 per cent in furnace capacity since 1920. At the same time the number of serviceable furnaces had been reduced from 330 in 1913 to 210 in October, this year. The figures point to a decided

improvement in German practice—elimination of small furnaces and an increase in average output through larger new stacks and faster operation. The use of increasing quantities of Swedish ores may be one factor in the account, as well as the charging of larger proportions of scrap.

QUITE remarkable was the output of Alabama blast furnaces in November, a new record for a month having been made. THE IRON AGE'S returns show 274,600 tons produced, and to this the nearest approach was 257,700 tons in December, 1925. In the war years a high record was 248,800 tons in October, 1916. Since then the tendency has been toward larger outputs with fewer furnaces. On Dec. 1 the twenty-two active furnaces had a capacity of 8645 tons per day, or 393 tons per furnace, also a record. On Nov. 1, 1916, the twenty-eight furnaces were operating at 7455 tons per day or 266 tons per furnace. Here is a gain of about 48 per cent in output per furnace in ten years. While Alabama outputs cannot compare with those of the large steel company furnaces in the Middle West, operating on high-grade Lake ores, the November achievement is notable when character of ores and size of furnaces are considered. It also directs attention to some of the improvements in design and the economies in operation which the Alabama companies, in common with those in the North, have been able to effect.

LOW COST OF FRENCH STEEL

Wages a Small Fraction of Those Paid in American Mills

On his return some weeks ago from a ten months' tour of Europe, G. C. Broomall, director of the service engineering department, American Rolling Mill Co., Middletown, Ohio, contributed to the Middletown *Journal* some observations on political, social and industrial conditions in continental countries. Readers of THE IRON AGE will be interested in the schedule of sheet mill wages in France, which Mr. Broomall found in effect at one of the plants of Compagnie des Forges de Chatillon, Commentry et Neuves Maison, in September of this year, when the franc was worth 3c. and less. We quote as follows from his article:

"First sheet mill roller: Day rate, 20.50 francs; extra for family, 3.50 francs; bonus, 16 francs; total, 40 francs. Maximum he can earn is 42 francs.

"First heater: Day rate, 18.50 francs; extra for family, 3.50 francs; bonus, 12 francs; total, 34 francs.

"Other members of crew: Day rate, 14.50 francs; extra for family, 3.50 francs; bonus, 8.80 francs; total, 26.80 francs.

"All for eight hours, less 40 minutes at noon for eating.

"Rates on open-hearth about the same as for sheet mill.

"Common labor: Day rate, 14 francs; extra for family, 3.50 francs; bonus, 3 francs; total, 20.50 francs.

"Expenditures for a family of four people:

"Shoes cost 55 to 60 francs per pair. House rent (if company house) 360 francs per year. House rent (if not company house) 500 to 550 francs per year. Ordinary clothing, 400 francs per suit. Fuel sold by plant, 100 francs per ton.

"Average meal and cost of same:

"Breakfast—Soup with bread, cheese, wine (1 glass).

"Lunch—Their real heavy meal: meat and potatoes, cheese, bread, wine.

"Supper—What is left of lunch, with a soup, cheese and wine.

"The soup is made of vegetables, thickened with spaghetti or vermicelli; no meat. Don't forget that with this wage the wife must work also; it is not sufficient to support the family. Until standards of living are placed on a higher plane, until the great mass of working people can earn an increased wage to support a higher standard, mass production will be limited to very narrow environment. Mass production is of no value unless backed up by mass buying. The buying ability of a people is based upon its wage capacity. Why turn out 100 pairs of shoes a day if you can only sell 25? The wage earners of the United States must keep that wage up, not by strikes or violence, but by mutual, friendly agreement between employer and employee. But value must be given for value received."

It will be seen that as against $4 an eight-hour day for common labor in American steel works, the Commentry rate, with extra for family and bonus, is but 61.5c., with the franc at 3c., and 82c. when the franc is 4c.

Studies Ebb and Flow of Migration of Labor

How the tide of migration ebbs and flows with seasonal and cyclical changes in industrial activity is described in a report just issued by the National Bureau of Economic Research, West Twenty-fourth Street, New York. In "Migration and Business Cycles," the bureau presents, in form of a book of 250 pages illustrated with 55 charts and 65 tables, the results of the first of a new series of investigations made under the general direction of Dr. Edwin F. Gay and Dr. Wesley C. Mitchell, directors of research of the bureau, and with the counsel of the bureau's staff. Dr. Harry Jerome conducted the first of the economic studies in this series, dealing particularly with the "Shortage and surplus of labor in the United States in its relations to immigration and emigration."

The object of the inquiry was to answer:

1. To what extent do fluctuations in migration correspond with fluctuations in industrial activity? 2. What noteworthy variations appear when migrants are classified by sex, prior occupation, race or country of origin? 3. Are such fluctuations primarily determined by changes in the country of emigration or in the country of immigration? 4. What is the economic significance of the tendencies?

Ferromanganese Made in Mexico

Standard ferromanganese, containing 80 per cent manganese, was successfully produced in Mexico during December. It was made by the blast furnace of the Cia Fundidora de Fierro y Acero de Monterrey (Monterrey Iron & Steel Co.) Monterrey, Mexico, from raw materials obtained entirely in that country. The manganese ore was mined in the states of Durango, San Luis Potosi and Chihuahua. The superintendent of the furnace is D. J. Felkel.

Specifications for the fabrication and setting of sheet steel cornices have been issued by the Sheet Steel Trade Extension Committee, Oliver Building, Pittsburgh. They are published in the form favored by the American Institute of Architects and carry the file number A.I.A. 12L12. A section is devoted to general information and a short form specification is included.

The School of Engineering of Milwaukee formally dedicated its new home at Jackson and Oneida Streets, Dec. 16-18. The occasion was the twenty-third anniversary of the founding of the institution.

Iron and Steel Markets

Steel Output Fairly Maintained

Year's Total About 3,000,000 Tons More Than in 1925—Pig Iron Buyer Closes for 38,000 Tons—Large Plate Demand for Oil Industry—Sheet-Strip Competition at Detroit

AS 1926 ends, the steel industry is less active than in the final week of 1925, so far as new business is concerned. Production also is less, indications being that the December total of steel ingots will be not far from 3,400,000 tons, as against 3,970,000 tons in December one year ago. Last year the production curve was moving upward, while the present trend is downward—an 88 per cent operation in October, 80 per cent in November and a probable 73 per cent in December.

However, in view of the well maintained rate of Steel Corporation output this month, there being only the suspension of Christmas day and a few hours on Friday, the year's steel ingot production promises to be above rather than under 47,000,000 tons, against 44,140,000 tons in 1925.

While no marked increase in steel output is looked for in January, the possibilities of the coal situation after April 1 will tend to the maintenance of the present rate, even though there be some stocking of ingots for a time.

Some steel producers estimate their December orders at substantially the total of November, railroad buying this month making up for some falling off in other lines.

Chicago is still reporting large inquiry as well as actual orders for track supplies, and the week's scattered rail buying at Chicago amounted to 15,000 tons. Rail sales and inquiries in Ohio were 8500 tons, besides which is a considerable tonnage of track supplies for the new Chesapeake & Hocking Valley extension.

Chicago district rail mills are running at 75 per cent and this rate will be increased early in the new year as railroads are now calling for their spring rails.

A situation is developing in automobile body steel, as the result of the long-expected competition between sheets and wide strips. Makers of the latter have lately named prices at Detroit that are materially below recent quotations on body sheets.

While motor car builders talk hopefully of the 1927 outlook they are buying sparingly and are likely to make little increase in production schedule until after the New York and Chicago shows.

Except in sheets and cold-rolled strips prices of finished steel show a good deal of steadiness, though it is still evident that some considerable buyers are postponing the issue on 2c. bars.

Oil industry buying in November was responsible for the largest bookings in fabricated plate work since April, 1923. In the total of 50,863 tons, over 40 per cent was for storage tanks and refinery materials. Tank cars accounted for 35 per cent of the remainder.

The feature of the week in pig iron was the closing of contracts for 38,000 tons for the Standard Sanitary Mfg. Co.—20,000 tons in the Pittsburgh market and 18,000 tons in southern Ohio. The Valley price in these transactions was $18.50 for No. 2 and the Louisville, Ky., price $21.90. Otherwise the pig iron market is uneventful, the Eastern situation still giving evidence of a more than ample supply of merchant iron.

Close to 50,000 tons of ferromanganese has been put under contract for delivery in the first half of 1927 to large consumers. Other ferroalloys, including 50 per cent ferrosilicon and standard ferrochromium, have also been bought in fairly large quantities.

Bookings of steel castings for the eleven months ended Nov. 30 were 10½ per cent greater in tonnage than in the same period last year. Nearly 40 per cent was for railroad needs. Production up to Dec. 1 amounted to about 1,105,000 gross tons.

Imports of iron and steel products into the United States in the first 11 months of 1926—1,035,531 gross tons—were the largest since 1903. Pig iron, with 430,819 tons, accounted for nearly 42 per cent and scrap was an additional 8 per cent. Rolled and finished steel, 363,430 tons (about 210,000 tons to Dec. 1 last year), represented 35 per cent. Cast iron pipe, 71,779 tons, was 7 per cent of the total.

THE IRON AGE composite price for pig iron remains for a second week at $19.88, compared with $21.79 last year. Finished steel stands for the twelfth week at 2.453c. per lb., the same level as a year ago.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics
At Date, One Week, One Month, and One Year Previous

For Early Delivery

Pig Iron, Per Gross Ton:	Dec.27, 1926	Dec.21, 1926	Nov.30, 1926	Dec.28, 1925
No. 2, fdy., Philadelphia..	$22.76	$22.76	$23.26	$23.76
No. 2, Valley furnace.....	18.50	18.50	19.00	20.50
No. 2, Southern, Cin'ti....	23.69	23.69	23.69	25.69
No. 2, Birmingham.....	20.00	20.00	20.00	22.00
No. 2 foundry, Chicago*..	21.00	21.00	21.00	23.00
Basic, del'd eastern Pa...	22.00	22.00	22.50	23.00
Basic, Valley furnace.....	18.50	18.50	18.50	20.00
Valley Bessemer, del'd P'gh	*21.26*	21.76	21.76	22.76
Malleable, Chicago*	21.00	21.00	21.00	23.00
Malleable, Valley	18.50	18.50	19.00	20.50
Gray forge, Pittsburgh...	19.76	19.76	20.26	21.76
L. S. charcoal, Chicago...	27.04	27.04	27.04	29.04
Ferromanganese, furnace..	100.00	100.00	100.00	115.00
Rails, Billets, etc., Per Gross Ton:				
O.-h. rails, heavy, at mill.	$43.00	$43.00	$43.00	$43.00
Light rails at mill.....	36.00	36.00	36.00	36.96
Bess. billets, Pittsburgh..	35.00	35.00	35.00	35.00
O.-h. billets, Pittsburgh...	35.00	35.00	35.00	35.00
O.-h. sheet bars, P'gh.....	36.00	36.00	36.00	36.00
Forging billets, P'gh.....	40.00	40.00	40.00	40.00
O.-h. billets, Phila.....	40.30	40.30	40.30	41.30
Wire rods, Pittsburgh....	45.00	45.00	45.00	45.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.90	1.90	1.90	1.90
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia...	2.22	2.22	2.22	2.22
Iron bars, Chicago.....	2.00	2.00	2.00	2.00
Steel bars, Pittsburgh....	2.00	2.00	2.00	2.00
Steel bars, Chicago.....	2.10	2.10	2.10	2.10
Steel bars, New York.....	2.34	2.34	2.34	2.34
Tank plates, Pittsburgh..	1.90	1.90	1.90	1.90
Tank plates, Chicago.....	2.10	2.10	2.10	2.10
Tank plates, New York...	2.24	2.24	2.24	2.09
Beams, Pittsburgh	2.00	2.00	2.00	1.90
Beams, Chicago	2.10	2.10	2.10	2.10
Beams, New York.....	2.34	2.34	2.34	2.24
Steel hoops, Pittsburgh...	2.50	2.50	2.50	2.50

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

Sheets, Nails and Wire,	Dec.27, 1926	Dec.21, 1926	Nov.30, 1926	Dec.28, 1925
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 24, P'gh	3.00	3.00	3.00	3.20
Sheets, black, No. 24, Chicago dist. mill.....	3.20	3.20	3.20	3.30
Sheets, galv., No. 24, P'gh	3.85	3.85	3.85	4.15
Sheets, galv., No. 24, Chicago dist. mill.....	4.05	4.05	4.05	4.25
Sheets, blue, 9 & 10, P'gh	2.30	2.30	2.30	2.50
Sheets, blue, 9 & 10, Chicago dist. mill.....	2.50	2.50	2.50	2.60
Wire nails, Pittsburgh....	2.65	2.65	2.65	2.65
Wire nails, Chicago dist. mill	2.70	2.70	2.70	2.70
Plain wire, Pittsburgh....	2.50	2.50	2.50	2.50
Plain wire, Chicago dist. mill	2.55	2.55	2.55	2.55
Barbed wire, galv., P'gh..	3.35	3.35	3.35	3.35
Barbed wire, galv., Chicago dist. mill.....	3.40	3.40	3.40	3.40
Tin plate, 100 lb. box, P'gh	$5.50	$5.50	$5.50	$5.50
Old Material, Per Gross Ton:				
Carwheels, Chicago	$14.50	$14.50	$14.50	$18.00
Carwheels, Philadelphia ..	16.50	16.50	16.50	18.50
Heavy melting steel, P'gh.	16.50	16.50	17.00	19.00
Heavy melting steel, Phila.	15.50	15.50	15.50	17.50
Heavy melting steel, Ch'go	13.00	13.00	13.00	15.25
No. 1 cast, Pittsburgh....	16.00	16.00	16.00	17.50
No. 1 cast, Philadelphia..	17.00	17.00	17.00	18.50
No. 1 cast, Ch'go (net ton)	**16.50**	16.00	16.00	17.00
No. 1 RR. wrot., Phila....	17.00	17.00	17.00	18.50
No. 1 RR. wrot., Ch'go (net)	12.00	12.00	12.50	13.50
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt....	$3.50	$3.50	$3.90	$5.50
Foundry coke, prompt....	4.50	4.50	5.00	5.50
Metals				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York...	*13.62½*	13.75	13.75	14.25
Electrolytic copper, refinery	*13.25*	13.32½	13.37½	13.87½
Zinc, St. Louis.....	7.02½	7.02½	7.15	8.62½
Zinc, New York.....	7.37½	7.37½	7.50	8.97½
Lead, St. Louis.....	7.65	7.65	7.80	9.00
Lead, New York.....	7.80	7.80	8.00	9.25
Tin (Straits), New York..	*67.00*	68.00	71.75	63.37½
Antimony (Asiatic), N. Y.	**13.25**	13.00	14.00	22.25

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Pittsburgh

Sanitary Company Buys 38,000 Tons of Pig Iron — Wide Strip Affects Body Sheet Prices

PITTSBURGH, Dec. 27.—Events of the week have not been of a character to materially alter the belief commonly held recently that the new year will get off to a rather slow start in steel. Mail orders today were of fair size in some products but, representing an accumulation of three days over the end of last week, were not considered as marking any particular pickup in business. Except for the loss of production occasioned by the suspension for Christmas, no marked change is noted from the recent rate of ingot production, which still is placed at 65 per cent of capacity for this and nearby districts. Prices show a good deal of steadiness in all finished products, except in sheets and cold-rolled strips.

The leading interest still reports sheet business at the full first quarter prices, but is meeting competition in automobile body sheets. A serious price situation is developing on account of competition from the recently developed wide strip. Makers of the latter are reported to be very materially underselling makers of body sheets in the Detroit district and are said to be even giving away a large part of the saving there is in rolling steel suitable for automobile bodies on continuous mills over that rolled on regular sheet mills.

The pig iron market presents the big feature of the week in a purchase by the Standard Sanitary Mfg. Co. of 38,000 tons of foundry iron, almost equally divided between its local and its Louisville, Ky., plants. Iron for the local plants was secured at $18.50, Valley furnace, for No. 2 and the metal for Louisville was at a delivered price of $21.90, this iron all coming from southern Ohio furnaces. The scrap market does not show much activity, and prices are without change, except on the lighter grades, which are slightly stronger in reflection of a lighter output by the automobile companies. The coke market is lifeless but production is low, and with the possibility that there may not be a general retreat from the advanced wage scales set up Nov. 1, last, there is not much pressure to sell.

Pig Iron.—As was indicated in these reports a week ago, the Standard Sanitary Mfg. Co. has bought early 1927 iron at $18.50, Valley Furnace, for No. 2 grade. Its total purchases are much in excess of the amount mentioned in the formal inquiries. For its Allegheny and New Brighton, Pa., plants they were 20,000 tons, and for Louisville the purchase amounted to 18,000 tons. For the latter plant, all southern Ohio iron was bought, as the delivered price was $21.90, or $19.25 at Ironton, while Birmingham iron was held at $20, furnace, which would have meant a delivered price of $23.39. As the company is carrying over a fair-sized

amount of iron bought for delivery in the last half of this year, its latest purchases will carry it fairly well into the second quarter of the year unless there is a stepping up in its consumption from the present rate. There is nothing of interest in the steel-making grades, except the first quarter inquiry of the American Steel Foundries for its Verona, Pa., works. Basic is still quoted at $18.50, Valley furnace, but it is doubtful if that price will be obtained on the business now offered. Bessemer iron is still selling in small lots at $20, Valley furnace, but has been offered at $19.50.

We quote Valley furnace, the freight for delivery to the Cleveland or Pittsburgh district being $1.76 per gross ton:

Basic	$18.50
Bessemer	$19.50 to 20.00
Gray forge	18.00 to 18.50
No. 2 foundry	18.50 to 19.00
No. 3 foundry	18.00 to 18.50
Malleable	18.50 to 19.00
Low phosphorus, copper free	28.00

Ferroalloys.—There is still a tendency among important consumers of ferromanganese to defer making first half commitments, but there is no anxiety among producers and consequently no weakening in prices. Single carloads of spiegeleisen are priced at $37, furnace, for average 20 per cent grade and $36 for 16 to 19 per cent alloy, with larger lots at lower prices, depending on the tonnage and the delivery, and with large tonnages for shipment over the first half of next year carrying the same prices as in the past six months. Most users of high-grade ferrosilicon have contracted for their 1927 requirements.

Steel and Iron Bars.—Some rush orders for screw stock bars in small lots are reaching the mills in keeping with the tonnage releases of the automobile parts makers to the makers of cold-finished steel bars, but generally, the market is slow in hot-rolled bars. Not enough first quarter business has yet developed to provide a test of prices, but on small tonnages for prompt shipment 2c., base Pittsburgh, is all that can be done. Iron bars are slow and easy.

Structural Steel.—The ordinary tonnage price holds at 2c., base Pittsburgh. Demands upon the mills are still moderate, particularly from local fabricators, whose shipments exceed new business.

Plates.—Mills in this area are comparatively well supplied with business, and there is the promise of more in the car orders now before the market. If there is shading of 1.90c., base Pittsburgh, it is well concealed.

Wire Products.—No material increase in demand is observed, and the more common report is that forward buying is much lighter than it was a year ago. Jobbers and manufacturing consumers seem to have no anxiety about their ability to get supplies when they need them, and there is nothing to suggest a change in prices in the near future.

Rails and Track Supplies.—So far as standard-section rails are concerned, the orders are in and it is now a matter of shipments. These are starting and will be on an increasing scale as the track-laying period approaches. Accessory specifications are moderate. Light-section rails are only moderately active, but prices are holding.

Tubular Goods.—The market is passing through a quiet period that is common to this time of year. Mill operations are fairly high, because there are some good line pipe orders in process, and replenishment of mill stocks also is in progress. A fair movement of mechanical tubing to automobile manufacturers is noted, and locomotive builders are fairly good buyers of tubes, but ordinary boiler tubes are not selling with much snap. Discounts are given on page 1847.

Sheets.—Low prices for wide strips are giving considerable concern to makers of automobile body sheets. Apparently the former are being based on the present prices of cold-rolled strips, which are selling in large tonnages at 3c., base, and, even with standard extras, are well under body sheets at 4.25c., base, for No. 20 gage.. The leading interest still reports sales of the common finishes at the full first quarter quotations, but is meeting competition at least to the extent of $2 per ton. Metal furniture sheets have sold at 2.95c., base, for black sheets, which produces a price of 4.10c. for Grade A. December is making a poor showing as compared with the same month last year, and while shipments for the year will amount to approximately 10 per cent more than last year, this is below earlier expectations, shipments to the end of October having run 14 per cent ahead of last year.

Tin Plate.—Some loss of production has resulted from mill suspensions incident to Christmas, but the general rate of output remains high. Consumers are not specifying with real freedom, but mills feel safe in rolling and producing against future orders the general size and character of which are known.

Cold-Finished Steel Bars.—A fair amount of business is embraced in recent releases against suspended shipments and in small-lot supplementary purchases. Some makers have fair-sized January order books. Generally, however, the demand is setting up no tax upon productive capacity. The aim of makers as to prices is still 2.40c., base, Pittsburgh, but all producers are not adhering rigidly to that figure.

Hot-Rolled Strips.—Business is slow, but prices are well maintained.

Cold-Rolled Strips.—Prices are no more settled than they have been. All makers are not following the

THE IRON AGE Composite Prices

Finished Steel

Dec. 27, 1926, 2.453c. Per Lb.

One week ago	2.453c.
One month ago	2.453c.
One year ago	2.453c.
10-year pre-war average	1.689c.

Based on steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets. These products constitute 87 per cent of the United States output of finished steel.

	High		Low	
1926	2.453c.,	Jan. 5;	2.403c.,	May 18
1925	2.560c.,	Jan. 6;	2.396c.,	Aug. 18
1924	2.789c.,	Jan. 15;	2.460c.,	Oct. 14
1923	2.824c.,	April 24;	2.446c.,	Jan. 2

Pig Iron

Dec. 27, 1926, $19.88 Per Gross Ton

One week ago	$19.88
One month ago	20.13
One year ago	21.79
10-year pre-war average	15.72

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High		Low	
1926	$21.54,	Jan. 5;	$19.46,	July 13
1925	22.50,	Jan. 13;	18.96,	July 7
1924	22.88,	Feb. 26;	19.21,	Nov. 3
1923	30.86,	March 20;	20.77,	Nov. 20

Mill Prices of Finished Iron and Steel Products

Iron and Steel Bars

Soft Steel

	Base Per Lb.
F.o.b. Pittsburgh mills	2.00c. to 2.10c.
F.o.b. Chicago	2.10c.
Del'd Philadelphia	2.32c.
Del'd New York	2.34c.
Del'd Cleveland	2.19c.
F.o.b. Cleveland, sizes up to 1-in. rounds	2.00c.
F.o.b. Birmingham	2.15c. to 2.25c.
C.i.f. Pacific ports	2.35c.
F.o.b. San Francisco mills	2.35c. to 2.40c.

Billet Steel Reinforcing

F.o.b. Pittsburgh mills	2.00c. to 2.10c.

Rail Steel

F.o.b. mill	1.80c. to 1.90c.
F.o.b. Chicago	1.90c. to 2.00c.

Iron

Common iron, f.o.b. Chicago	2.00c.
Refined iron, f.o.b. P'gh mills	2.90c. to 3.00c.
Common iron, del'd Philadelphia	2.22c.
Common iron, del'd New York	2.24c.

Tank Plates

	Base Per Lb.
F.o.b. Pittsburgh mill	1.90c.
F.o.b. Chicago	2.10c.
F.o.b. Birmingham	2.05c. to 2.15c.
Del'd Cleveland	2.09c.
Del'd Philadelphia	2.22c.
Del'd New York	2.24c.
C.i.f. Pacific ports	2.30c.

Structural Shapes

	Base Per Lb.
F.o.b. Pittsburgh mill	2.00c. to 2.10c.
F.o.b. Chicago	2.10c.
F.o.b. Birmingham	2.15c. to 2.25c.
Del'd Cleveland	2.19c.
Del'd Philadelphia	2.22c. to 2.32c.
Del'd New York	2.34c
C.i.f. Pacific ports	2.35c.

Hot-Rolled Flats (Hoops, Bands and Strips)

	Base Per Lb.
All gages, narrower than 6 in., P'gh	2.50c.
All gages, 6 in. and wider, P'gh	2.30c.
All gages, narrower than 6 in., Chicago,	2.50c. to 2.60c.
All gages, 6 in. and wider, Chicago	2.50c.

Cold-Finished Steel

	Base Per Lb.
Bars, f.o.b. Pittsburgh mills	2.30c. to 2.40c.
Bars, f.o.b. Chicago	2.40c.
Bars, Cleveland	2.45c.
Shafting, ground, f.o.b. mill	*2.55c. to 3.00c.
Strips, f.o.b. Pittsburgh mills	3.00c. to 3.40c.
Strips, f.o.b. Cleveland mills	3.00c. to 3.40c.
Strips, delivered Chicago	3.30c. to 3.70c.
Strips, f.o.b. Worcester mills	3.75c.

*According to size.

Wire Products

(To jobbers in car lots, f.o.b. Pittsburgh and Cleveland)

	Base Per Keg
Wire nails	$2.65
Galv'd nails, 1-in. and longer	4.65
Galv'd nails, shorter than 1-in.	4.90
Galvanized staples	3.35
Polished staples	3.10
Cement coated nails	2.65

	Base Per 100 Lb.
Bright plain wire, No. 9 gage	$2.50
Annealed fence wire	2.65
Spring wire	3.50
Galv'd wire, No. 9	3.10
Barbed wire, galv'd	3.35
Barbed wire, painted	3.10

Chicago district mill and delivered Chicago prices are $1 per ton above the foregoing. Birmingham mill prices $3 a ton higher; Worcester, Mass., mill $3 a ton higher on production of that plant; Duluth, Minn., mill $2 a ton higher; Anderson, Ind., $1 higher.

Woven Wire Fence

	Base to Retailers Per Net Ton
F.o.b. Pittsburgh	$65.00
F.o.b. Cleveland	65.00
F.o.b. Anderson, Ind.	66.00
F.o.b. Chicago district mills	67.00
F.o.b. Duluth	68.00
F.o.b. Birmingham	68.00

Sheets

Blue Annealed

	Base Per Lb.
Nos. 9 and 10, f.o.b. Pittsburgh	2.25c. to 2.40c.
Nos. 9 and 10, f.o.b. Ch'go dist. mill	2.50c.
Nos. 9 and 10, del'd Philadelphia	2.57c. to 2.72c.
Nos. 9 and 10, f.o.b. Birmingham	2.60c. to 2.70c.

Box Annealed, One Pass Cold Rolled

No. 24, f.o.b. Pittsburgh	2.90c. to 3.10c.
No. 24, f.o.b. Ch'go dist. mill	3.20c.
No. 24, del'd Philadelphia	3.22c. to 3.32c.
No. 24, f.o.b. Birmingham	3.30c. to 3.40c.

Metal Furniture Sheets

No. 24, f.o.b. Pittsburgh, A grade	4.10c. to 4.25c.
No. 24, f.o.b. Pittsburgh, B grade	3.95c. to 4.10c.

Galvanized

No. 24, f.o.b. Pittsburgh	3.85c. to 3.95c.
No. 24, f.o.b. Chicago dist. mill	4.05c.
No. 24, del'd Philadelphia	4.17c. to 4.32c.
No. 24, f.o.b. Birmingham	4.20c. to 4.30c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	3.10c. to 3.25c.
No. 28, f.o.b. Chicago dist. mill	3.25c. to 3.35c.

Automobile Body Sheets

No. 20, f.o.b. Pittsburgh	4.25c.

Long Ternes

No. 24, 8-lb. coating, f.o.b. mill	4.30c.

Tin Plate

	Per Base Box
Standard cokes, f.o.b. P'gh district mills	$5.50
Standard cokes, f.o.b. Gary and Elwood, Ind.	5.60

Terne Plate

(*F.o.b. Morgantown or Pittsburgh*)

(Per package, 20 x 28 in.)

8-lb. coating, 100 lb. base	$11.40
8-lb. coating I.C.	11.70
15-lb. coating I.C.	14.85
20-lb. coating I.C.	$16.20
25-lb. coating I.C.	17.90
30-lb. coating I.C.	19.45
40-lb. coating I.C.	21.65

Alloy Steel Bars

(F.o.b. Pittsburgh or Chicago)

S. A. E. Series Numbers		Base Per 100 Lb.
2100*	(1¼% Nickel, 0.10% to 0.20% Carbon)	$3.20 to $3.25
2300	(3½% Nickel)	4.35 to 4.50
2500	(5% Nickel)	5.50 to 5.65
3100	(Nickel Chromium)	3.40 to 3.50
3200	(Nickel Chromium)	5.00 to 5.25
3300	(Nickel Chromium)	7.00 to 7.25
3400	(Nickel Chromium)	6.25 to 6.50
5100	(Chromium Steel)	3.40 to 3.50
5200*	(Chromium Steel)	7.00 to 7.50
6100	(Chrom. Vanadium bars)	4.30
6100	(Chrom. Vanad. spring steel)	3.80
9250	(Silicon Manganese spring steel)	3.20 to 3.25
	Carbon Vanadium (0.45% to 0.55% Carbon, 0.15% Vanad.)	4.10 to 4.20
	Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chrom., 0.15 Vanad.)	4.30
	Chromium Molybdenum bars (0.80—1.10 Chrom., 0.25—0.40 Molyb.)	4.25 to 4.35
	Chromium Molybdenum bars (0.50—0.70 Chrom., 0.15—0.25 Molyb.)	3.40 to 3.50
	Chromium Molybdenum spring steel (1—1.25 Chrom., 0.30—0.50 Molybdenum)	4.50 to 4.75

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10 in. the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4 in. down to and including 2½-in. squares, the price is $5 a gross ton above the 4 x 4 billet price.

*Not S. A. E. specifications, but numbered by manufacturers to conform to S. A. E. system.

Rails

	Per Gross Ton
Standard, f.o.b. mill	$43.00
Light (from billets), f.o.b. mill	36.00
Light (from rail steel), f.o.b. mill	34.00
Light (from billets), f.o.b. Ch'go mill	$36.00 to $38.00

Track Equipment

(F.o.b. Mill)

	Base Per 100 Lb.
Spikes, ⅜ in. and larger	$2.80 to $3.00
Spikes, ½ in. and smaller	2.90 to 3.35
Spikes, boat and barge	3.35
Track bolts, all sizes	3.90 to 4.50
Tie plates, steel	2.35
Angle bars	2.75

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛	45	19½	¼ to ⅜	+11	+39
¼ to ⅜	51	25½	½	22	2
½	56	42½	¾	28	11
¾	60	48½	1 to 1½	30	12
1 to 3	62	50½			

Lap Weld

2	55	43½	2	23	7
2½ to 6	59	47½	2½	26	11
7 and 8	56	43½	3 to 6	28	13
9 and 10	54	41½	7 to 12	26	11
11 and 12	53	40½			

Butt Weld, extra strong, plain ends

⅛	41	24½	¼ to ⅜	+19	+54
¼ to ⅜	47	30½	½	21	7
½	53	42½	¾	28	12
¾	58	47½	1 to 1½	30	14
1 to 1¼	60	49½			
2 to 3	61	50½			

Lap Weld, extra strong, plain ends

2	53	42½	2	23	9
2½ to 4	57	46½	2½ to 4	29	15
4½ to 6	56	45½	4½ to 6	28	14
7 to 8	52	39½	7 to 8	21	7
9 and 10	45	32½	9 to 12	16	2
11 and 12	44	31½			

To the large jobbing trade the above discounts on steel pipe are increased on black by one point, with supplementary discount of 5%, and on galvanized by 1½ points, with supplementary discount of 5%. On iron pipe, both black and galvanized, the above discounts are increased to large jobbers by one point with supplementary discounts of 5 and 2½%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Lap Welded Steel		Charcoal Iron	
2 to 2¼ in.	27	1½ in.	+18
2½ to 2¾ in.	37	1¾ to 1½ in.	+ 8
3 in.	40	2 to 2¼ in.	— 2
3¼ to 3¾ in.	42½	2½ to 3 in.	— 7
4 to 13 in.	46	3¼ to 4½ in.	— 9

Beyond the above discounts, 5 to 7 fives extra are given on lap welded steel tubes and 2 tens to 2 tens and 1 five on charcoal iron tubes.

Standard Commercial Seamless Boiler Tubes

Cold Drawn

1 in.	60	3 in.	45
1¼ to 1½ in.	52	3¼ to 3½ in.	47
1¾ in.	36	4 in.	50
2 to 2¼ in.	31	4½, 5 and 6 in.	45
2½ to 2¾ in.	39		

Hot Rolled

2 and 2¼ in.	34	3¼ and 3½ in.	50
2½ and 2¾ in.	42	4 in.	53
3 in.	48	4½, 5 and 6 in.	48

Less carloads, 4 points less. Add $3 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tube list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.30%, base	55
Carbon, 0.30% to 0.40%, base	50

Plus differentials for lengths over 18 ft. and for commercially exact lengths. Warehouse discounts on small lots are less than the above.

price schedule calling for a graduated decline from a price based on small tonnages, but generally the prices produced by that schedule are the basis of business. That means 3c. for large lots and 3.40c. for small tonnages. Business is quiet.

Bolts, Nuts and Rivets.—Business is just fair in bolts and nuts, and with hardly enough to give all a share, there continues to be some quoting of the carload discounts on less-than-carload lots. The rivet market continues weak, with $2.40, base, per 100 lb., Pittsburgh, ruling for large ones, and with small rivets commonly quoted at 70, 10 and 5 off list.

Coal and Coke.—The question of wages in the Connellsville district is still unsettled, with the larger commercial producers as well as the steel companies operating mines there inclined to hold to the advanced scale established Nov. 1, this year. A number of the smaller producers have cut to the November, 1917, scale, but those producing the greater part of the tonnage seem loath to invite trouble by cutting at a time when the steel companies are paying the full union rate. Business in coal and coke remains very quiet, but production has fallen to the extent of the operations that cannot produce profitably at present prices. The uncertainty about a general wage cut also lessens selling pressure. Standard furnace fuel still commands $3.50 per net ton at ovens and is held even higher by some producers.

Old Material.—Machine shop turnings and other grades of that general classification are not as plentiful as they have been and are held for higher prices. No special change is noted in other grades, but it is noted that heavy steel, while hard to sell at $17, is just as hard to obtain at $16.50, which is all that dealers are willing to pay against short sales. Consumer interest in the market is very low.

We quote for delivery to consumers' yards in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

Per Gross Ton

Heavy melting steel	$16.50 to $17.00
Scrap rails	16.00 to 16.50
No. 1 cast, cupola size	16.00 to 16.50
Compressed sheet steel	15.50 to 16.00
Bundled sheets, sides and ends	14.50 to 15.00
Railroad knuckles and couplers	18.50 to 19.00
Railroad coil and leaf springs	18.50 to 19.00
Low phosphorus blooms and billet ends	21.00 to 21.50
Low phosphorus mill plates	20.50 to 21.00
Low phosphorus, light grade	17.50 to 18.00
Low phosphorus punchings	18.50 to 19.00
Steel car axles	21.50 to 22.00
Cast iron wheels	16.00 to 16.50
Rolled steel wheels	18.50 to 19.00
Machine shop turnings	12.00 to 12.50
Short shoveling steel turnings	13.00 to 13.50
Sheet bar crops	17.00 to 17.50
Heavy steel axle turnings	15.00 to 15.50
Short mixed borings and turnings	12.00 to 12.50
Heavy breakable cast	15.00 to 15.50
Cast iron borings	12.00 to 12.50
No. 1 railroad wrought	13.00 to 13.50
No. 2 railroad wrought	16.50 to 17.00
Railroad or automobile malleable scrap	16.50 to 17.00

Warehouse Prices, f.o.b. Pittsburgh

	Base per Lb.
Tank plates	3.00c.
Structural shapes	3.00c.
Soft steel bars and small shapes	2.90c.
Reinforcing steel bars	2.90c.
Black sheets (No. 24 gage), 25 or more bundles	3.95c.
Galvanized sheets (No. 24 gage), 25 or more bundles	4.70c.
Blue annealed sheets (No. 10 gage), 25 or more sheets	3.40c.
Cold-finished shafting and screw stock—	
Rounds and hexagons	3.60c.
Squares and flats	4.10c.
Bands	3.60c.
Spikes, large	3.30c.
Small	3.80c. to 5.25c.
Boat	3.80c.
Bolts, track	4.90c.
Wire, black soft annealed, base per 100 lb.	$3.00
Wire, galvanized soft, base per 100 lb.	3.00
Common wire nails, per keg	3.00
Cement coated nails, per keg	3.05

Early Cartel Movements in Germany

The tendency toward consolidation which has characterized European industrial developments has been studied by Louis Domeratzky, chief, regional information division, Department of Commerce. Among other things he says:

While the individual cartels existed in Germany long before the establishment of the empire, the real cartel movement did not begin until the middle of the seventies, under the pressure of the crisis following the industrial boom after the Franco-Prussian War. Their formation was facilitated by the existence of the numerous trade associations, many of which took part in the protectionist movement culminating in the adoption of the tariff of 1879. It is during that period that cartels were formed in such industries as coal, iron and potash, which are still among the most closely combined industries. The movement was accelerated along with the general industrial development of the country, so that it no longer needed the stimulus of an industrial crisis, and many cartels were organized during the boom periods of the eighties and nineties, some of them for the purpose of counteracting, through price fixing, the rising costs of raw materials.

Certain industries, especially those characterized by mass production and comparative uniformity of product, have lent themselves particularly to the cartel form of combination. Thus we find that of the 385 reported by the official investigation of 1895, the brick industry had 132 cartels; the iron and steel industry, 62; the chemical industry, 46; and the coal industry, 19. The early cartels confined themselves generally to a single industry, and there were few attempts at the vertical combinations which have come into prominence largely since the war. While many of the cartels had for their object the fixing of prices, some went in for division of territory, while others tried to prevent overproduction by restriction of output.

No figures are available as to the number of cartels in Germany at the outbreak of the war, but in 1911 it was estimated at about 600, and judging from the general economic program of the country during the succeeding two years there is good reason to assume that the number had increased during that period. At the outbreak of the war the cartel had become an integral part of the German economic structure and an institution enjoying the approval of the government, if the government's attitude in the case of the coal and potash combines can be interpreted as an expression of approval.

Recent Developments

The inflation regime brought about what might be called an orgy of combination, exemplified most strikingly by the Stinnes pyramid. Many of the amalgamations of that period were vertical in character and quite distinct from the cartel development of the pre-war period; some of the most spectacular ones succumbed during the stabilization period, if not before. There is no doubt, however, that, under the economic pressure of the immediate post-war period, there has been a decided shift from the comparatively loose cartel form of combination to the closer amalgamations involving complete or partial control through stock ownership and a community of interest between the raw material producers and the finishing industries.

One of the big factors in this development was the shortage of capital, which served to increase the advantage of the larger concerns possessing reserves or enjoying better credit facilities at home and abroad. Perhaps the most striking illustration of that new tendency is to be found in the recent developments of the dyestuff combination (I. G. der Farbenindustrie). This combination, which in 1925 replaced the looser pre-war cartel, realizing the changes in the international dyestuffs markets since the war, has extended its interests through amalgamation or plant extension to take in such related products as explosives, fertilizers, artificial silk, motor fuel, lacquers, etc.; at the same time it has also increased its holdings in raw materials, particularly coal and its by-products.

Semi-Finished Steel, Raw Materials, Bolts and Rivets

Mill Prices of Semi-Finished Steel

F.o.b. Pittsburgh or Youngstown

Billets and Blooms

	Per Gross Ton
Rerolling, 4-in. and over	$35.00
Rerolling, under 4-in. to and including 1¾-in.	36.00
Forging, ordinary	40.00
Forging, guaranteed	45.00

Sheet Bars

	Per Gross Ton
Open-hearth or Bessemer	$36.00

Slabs

	Per Gross Ton
8 in. x 2 in. and larger	$35.00
Smaller than 8 in. x 2 in.	36.00

Skelp

	Per Lb.
Grooved	1.90c.
Sheared	1.90c.
Universal	1.90c.

Wire Rods

	Per Gross Ton
*Common soft, base	$45.00
Screw stock	$5.00 per ton over base
Carbon 0.20% to 0.40%	2.00 per ton over base
Carbon 0.41% to 0.55%	5.00 per ton over base
Carbon 0.56% to 0.75%	7.50 per ton over base
Carbon over 0.75%	10.00 per ton over base
Acid	15.00 per ton over base

*Chicago mill base is $46. Cleveland mill base, $45

Prices of Raw Materials

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron	$4.55
Old range non-Bessemer, 51.50% iron	4.40
Mesabi Bessemer, 51.50% iron	4.40
Mesabi non-Bessemer, 51.50% iron	4.25
High phosphorus, 51.50% iron	4.15

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algeria	9.50c. to 10c.
Iron ore, Swedish, average 66% iron	9.50c.
Manganese ore, washed, 52% manganese, from the Caucasus	40c.
Manganese ore, high grade, nominal	35c. to 44c.
Tungsten ore, high grade, per unit, in 60% concentrates	$11.75 to $12.50
	Per Ton
Chrome ore, Indian basic, 48% Cr_2O_3, crude, c.i.f. Atlantic seaboard	$22.50
	Per Lb.
Molybdenum ore, 85% concentrates of MoS_2, delivered	50c. to 55c.

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville prompt	$3.50 to $3.75
Foundry, f.o.b. Connellsville prompt	4.50 to 5.50
Foundry, by-product, Ch'go ovens	9.75
Foundry, by-product, New England, del'd	13.50
Foundry, by-product, Newark or Jersey City, delivered	10.59 to 11.77
Foundry, Birmingham	5.50 to 6.00
Foundry, by-product, St. Louis or Granite City	10.00

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.75 to $2.25
Mine run coking coal, f.o.b. W. Pa. mines	2.00
Mine run gas coal, f.o.b. Pa. mines	2.10 to 2.25
Steam slack, f.o.b. W. Pa. mines	1.50 to 1.75
Gas slack, f.o.b. W. Pa. mines	1.75 to 2.00

Ferromanganese

	Per Gross Ton
Domestic, 80%, furnace or seab'd	$100.00
Foreign, 80%, Atlantic or Gulf port, duty paid	100.00

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$37.00
Domestic, 16 to 19%	36.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50%	$85.00 to $87.50
75%	145.00 to 150.00

	Per Gross Ton Furnace		Per Gross Ton Furnace
10%	$35.00	12%	$39.00
11%	37.00	14 to 16%	$45 to 46.00

Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio Furnace

Per Gross Ton		Per Gross Ton
10% $34.00	12%	$38.00
11% 36.00		

Silvery Iron

F.o.b. Jackson County, Ohio Furnace

Per Gross Ton		Per Gross Ton
6% $26.50	10%	$32.00
7% 27.50	11%	34.00
8% 28.50	12%	36.00
9% 30.00		

Other Ferroalloys

Ferrotungsten, per lb. contained metal, del'd	$1.05 to $1.10
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	11.50c.
Ferrovanadium, per lb. contained vanadium, f.o.b. furnace	$3.25 to $4.00
Ferrocarbontitanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads	$200.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per net ton	$91.00
Ferrophosphorus, electric, 24%, f.o.b. Anniston, Ala., per net ton	$122.50

Fluxes and Refractories

Fluorspar

	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silica, gravel, f.o.b. Illinois and Kentucky mines	$18.00
No. 2 lump, Illinois and Kentucky mines	$20.00
Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid,	$17.00 to $17.50
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silica, f.o.b. Illinois and Kentucky mines	$32.50

Fire Clay

	Per 1000 f.o.b. Works	
	High Duty	Moderate Duty
Pennsylvania	$40.00 to $43.00	$38.00 to $40.00
Maryland	43.00 to 46.00	38.00 to 40.00
New Jersey	55.00 to 75.00	
Ohio	40.00 to 43.00	38.00 to 40.00
Kentucky	40.00 to 43.00	38.00 to 40.00
Illinois	40.00 to 43.00	35.00 to 38.00
Missouri	40.00 to 42.00	35.00 to 38.00
Ground fire clay, per ton	6.50 to	7.50

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$40.00 to $43.00
Chicago	52.00
Birmingham	50.00
Silica clay, per ton	$8.00 to 9.00

Magnesite Brick

	Per Net Ton
Standard sizes, f.o.b. Baltimore and Chester, Pa.	$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00

Chrome Brick

	Per Net Ton
Standard size	$45.00

Mill Prices of Bolts, Nuts, Rivets and Set Screws

Bolts and Nuts

(Less-than-Carload Lots)

F.o.b. Pittsburgh, Cleveland, Birmingham and Chicago)

	Per Cent Off List
Machine bolts, small, rolled threads	60 and 10
Machine bolts, all sizes, cut threads	50, 10 and 10
Carriage bolts, smaller and shorter, rolled threads	50, 10 and 10
Carriage bolts, cut threads, all sizes	50 and 10
Eagle carriage bolts	65 and 10
Lag bolts	60, 10 and 10
Plow bolts, Nos. 3 and 7 heads	50 and 10
(Extra of 20% for other style heads)	
Machine bolts, c.p.c. and t. nuts, ⅜ x 4 in.,	45, 10 and 5
Larger and longer sizes	45, 10 and 5
Bolt ends with hot-pressed nuts	50, 10 and 10
Bolt ends with cold-pressed nuts	45, 10 and 5
Hot-pressed nuts, blank and tapped, square,	4.00c. per lb. off list
Hot-pressed nuts, blank or tapped, hexagons,	4.40c. per lb. off list
C.p.c. and t. square or hex. nuts, blank or tapped	4.10c. per lb. off list
Washers*	6.75c. to 6.50c. per lb. off list

*F.o.b. Chicago and Pittsburgh.

The discount on machine, carriage and lag bolts is 5 per cent more than above for car lots. On hot-pressed and cold-punched nuts the discount is 25c. more per 100 lb. than quoted above for car lots.

Bolts and Nuts

(Quoted with actual freight allowed up to but not exceeding 50c. per 100 lb.)

	Per Cent Off List
Semi-finished hexagons nuts:	
⅞ in. and smaller, U. S. S.	80, 10, 10 and 5
⅞ in. and larger, U. S. S.	75, 10, 10 and 5
Small sizes, S. A. E.	80, 10, 10, 10 and 5
S. A. E., ⅝ in. and larger	75, 10, 10, 10 and 5
Stove bolts in packages	80, 10 and 5
Stove bolts in bulk	80, 10, 5 and 2½
Tire bolts	60 and 5

Semi-Finished Castellated and Slotted Nuts

(Actual freight allowed up to but not exceeding 50c. per 100 lb.)

(To jobbers and consumers in large quantities)

	Per 100 Net S.A.E.	U.S.S.		Per 100 Net S.A.E.	U.S.S.
¼-in.	$0.44	$0.44	¾-in.	$2.35	$2.40
5/16-in.	0.515	0.515	⅞-in.	3.60	3.60
⅜-in.	0.62	0.66	1-in.	5.55	5.80
7/16-in.	0.79	0.90	1⅛-in.	8.90	8.90
½-in.	1.01	1.05	1¼-in.	12.60	13.10
9/16-in.	1.38	1.42	1⅜-in.	18.35	18.35
⅝-in.	1.70	1.73	1½-in.	21.00	21.00

Larger sizes.—Prices on application.

Large Rivets

	Base Per 100 Lb
F.o.b. Pittsburgh	$2.40 to $2.60
F.o.b. Cleveland	2.70
F.o.b. Chicago	$2.60 to 2.70

Small Rivets

	Per Cent Off List
F.o.b. Pittsburgh	70, 10 and 5 to 70 and 10
F.o.b. Cleveland	70, 10 and 5 to 70 and 10
F.o.b. Chicago	70, 10 and 5 to 70 and 10

Cap and Set Screws

(Freight allowed up to but not exceeding 50c per 100 lb.)

	Per Cent Off List
Milled cap screws	80 and 10
Milled standard set screws, case hardened,	80 and 5
Milled headless set screws, cut thread	80
Upset hex. head cap screws, U. S. S. thread,	80, 10 and 10
Upset hex. cap screws, S.A.E. thread,	80, 10 and 10
Upset set screws	80, 10 and 5
Milled studs	70 and 5

Chicago

Better Specifying of Bars—More Rail Buying—Silvery Advance Dropped

CHICAGO, Dec. 27.—The demand for finished steel products is holding close to that of the previous week. Frog and switch makers have come into the rail market, and their purchases, added to those of several small Western railroads, have enlarged mill books by 15,000 tons. Fresh inquiry and new business in track accessories are in large volume. Rail mills in this territory are operating at close to 75 per cent of capacity, but the railroads are pressing for deliveries, and it is probable that production will be further increased soon after the turn of the year. Users, anticipating their soft steel bar requirements for the early part of the first quarter, have issued more liberal specifications, and new buying, in small lots, is more active than a week ago.

There is little or no change in the rate of finished steel shipments. December will compare favorably with November in this respect, but it will fall somewhat behind the final month of 1925. The year now closing has been fairly steady from the standpoint of production, and the slowing up in December is looked upon by the trade as normal for this time of the year. While there were comparatively heavy shipments late in 1925, it is pointed out that production did not hold up during the summer of that year, and that as a result heavy tonnages were ordered out up to and into the early part of 1926.

Pig Iron.—It is probable that merchant pig iron production will soon be curtailed in this territory by the blowing out of one of the two Federal furnaces. Active furnaces include one Mayville, two Federal, the Zenith and two Iroquois, a total of six out of 10 in the district. It is now reported that the Thomas furnace will be out for at least four or five weeks longer. Shipments of pig iron during December were 10 to 15 per cent below those of November. This slowing down in demand has afforded producers an opportunity to balance and enlarge stocks. The Standard Sanitary Mfg. Co. has placed 18,000 tons of foundry iron at Louisville and 19,000 tons at Pittsburgh. A user in northern Illinois is in the market for 300 tons of Northern foundry iron. Both inquiry and new buying are light, transactions being almost wholly of carlot proportions. One lot of 250 tons of resale low phosphorus has been placed in this market at no concession in price. The demand for silvery is light, and producers have dropped the $1 advance that was quoted for delivery during the first quarter.

Quotations on Northern foundry, high phosphorus and malleable iron are f.o.b. local furnace, and do not include an average switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards:

Northern No. 2 foundry, sil. 1.75 to 2.25	$21.00
Northern No. 1 foundry, sil. 2.25 to 2.75	21.50
Malleable, not over 2.25 sil.	21.00
High phosphorus	21.00
Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago	27.04
Southern No. 2 (all rail)	26.01
Southern No. 2 (barge and rail)	24.18
Low phos., sil. 1 to 2 per cent, copper free	$31.50 to 32.50
Silvery, sil. 8 per cent	33.29
Bessemer ferrosilicon, 14 to 15 per cent	46.79

Plates.—Chicago district plate makers have order books that assure mills closing the year at about 65 per cent of capacity. Plate specifications for tanks, as well as general building construction, are holding up well. Railroad car construction programs have not progressed to the point where mills have received added business from that source. New business in oil tanks has been placed to the extent of 7000 tons, and fresh inquiry for tankage now totals over 10,000 tons. The Chicago & North Western is in the market for 100 suburban coaches, 20 combination passenger and baggage suburban cars and two gun cars. The Burlington is now asking for prices on five or six passenger car underframes. Current sales and specifications of plates are about equal to shipments. At 2.10c., Chicago, plates are lacking in firmness.

The mill quotation on plates is 2.10c. per lb., base, Chicago.

Ferroalloys.—On the whole, this market is quiet. Forward contracting appears to have gained no headway, and prices remain untested. Both domestic and English ferromanganese are being offered at $100, seaboard, but users are showing little or no interest. Sellers who have several hundred tons of the German product at New Orleans and who are willing to sell at $95, seaboard, report no sales.

We quote 80 per cent ferromanganese, $107.56, delivered Chicago; 50 per cent ferrosilicon, $85, delivered; spiegeleisen, 18 to 22 per cent, $44.56, delivered Chicago.

Structural Material.—Outstanding inquiry is large but inactive at the moment. Fabricators, who are booked for about six weeks, are not greatly concerned over the inactivity of the market at this time, because they believe that much of the tonnage before the trade will be placed early in the new year. In many cases projects have been financed, and the present delay in making awards is due largely to the preparation of detailed plans. Fabricators are not wholly satisfied with prices, but they find that the general level is somewhat higher than a year ago at this time. Tonnage already on shop books and the 35,000 tons, or more, on inquiry are tending to steady prices. Noteworthy awards this week are 1000 tons for the Longview Fibre Co., Longview, Wash., and 3100 tons for a bridge at Twin Falls, Idaho.

The mill quotation on plain material is 2.10c. per lb. base, Chicago.

Bars.—Total sales of soft steel bars are close to 50 per cent above those of the previous week. Forward contracting is slow, and current business is made up of small, miscellaneous orders. Specifications are fully 15 per cent heavier than a week ago. The greatest improvement in demand comes from the automotive trade, which is now the largest user of soft steel bars. Specifications from the railroads and makers of farm implements are steady. Mild steel bars are steady at 2.10c., Chicago. The automobile industry has not recovered as rapidly as the trade had expected, but first quarter contracting for alloy steel bars has progressed steadily, and specifications are now reaching mills for deliveries after Jan. 1. Prices of alloy steel bars are steady. The nominal quotation on iron bars is 2c., Chicago. Orders are unusually light, and specifications for deliveries next year are lacking. One mill in this district will shut down at the end of this week for repairs and alterations.

The rail steel bar market is quiet. Shipments of hard steel bars for concrete reinforcing purposes are holding at the rate of the previous week. Although December reinforcing bar business has been low as compared with November, nevertheless it exceeds that of the final month of a year ago, and makers estimate that total shipments for 1926 will exceed those of 1925 by at least 20 per cent. In general, hard bar mills find both specifications and new orders light. Forward contracting has made little headway. Fence post shipments against spring contracts are light, but makers now have release orders for the delivery of a substantial tonnage beginning with the second week in January. The mill of the Calumet Steel Co. will go down next week for repairs and will resume operations about Jan. 9. Rail steel bars are being widely quoted at 1.90c., Chicago, but for concrete reinforcement are bringing close to 2c., Chicago.

Mill prices per lb. are: Mild steel bars, 2.10c., base, Chicago; common bar iron, 2c. base, Chicago; rail steel bars, 1.90c. to 2c., base, Chicago.

Rails and Track Supplies.—Four railroads and several frog and switch makers have placed a total of close to 18,000 tons of standard-section rails with Chicago mills. Fresh inquiry is small, but several rail-

roads in the West still have 1927 contracts to place, and the trade looks for that business soon after Jan. 1. Four Western railroads have placed an aggregate of 18,000 tons of accessories in the week, and it is reported that an equal tonnage in active inquiries is pending. Orders for light rails are small, but they are about equal to those of the previous week. Rail mill operations are holding steady, but railroads are pressing for deliveries and larger shipments are expected early in January. Prices on rails and track supplies are firm.

Standard Bessemer and open-hearth rails, $43; light rails, rolled from billets, $36 to $38 per gross ton, f.o.b. maker's mill.

Standard railroad spikes, 2.90c. per lb. mill; track bolts with square nuts, 3.90c. mill; steel tie plates, 2.35c. mill; angle bars, 2.75c. mill.

Cast Iron Pipe.—Lower prices that have prevailed during the past two weeks have brought pipe foundries little or no added business. Small orders have held up to the average of the past two or three weeks, but they represent only the usual run of carload and less-than-carload business. Sellers, however, believe that a considerable number of municipalities will come into the market before the end of January. Present prices are not firm, and makers are withholding the announcement, if there is to be one, of quotations on pipe for winter manufacture. Three or four gas companies in the Middle West are now working on spring pipe-laying programs. Deliveries are fairly prompt on nearly all sizes of pipe. Bridgeport, Ohio, will take bids Dec. 27 on 90 tons of 10-in. and 40 tons of 8-in. Class B pipe. The American Cast Iron Pipe Co. is low bidder on 1700 tons of 6, 8, 12 and 24-in. centrifugal pipe for Minneapolis. The National Cast Iron Pipe Co. has taken, through a contractor, 200 tons of pipe for Glenview, Ill.

We quote per net ton, delivered, Chicago, as follows: Water pipe, 4-in., $50.20 to $51.20; 6-in. and over, $46.20 to $47.20; Class A and gas pipe, $4 extra.

Sheets.—Chicago district mill prices on sheets are untested. Small users who have been placing orders at the mills at the present price level are not offering serious resistance to the current market, but buyers who are still specifying against contracts made at lower prices are disinclined to place future business. Probably 80 per cent of fourth quarter contracts have been specified, and mills, in the hope that the market will stiffen, are willing to extend these obligations into the coming year. New buying, which is at close range, and specifications are lighter except from makers of troughs, metal lath and ceilings, who are now building up stocks of their products for the spring demand. Regardless of business that may be taken by mills between now and the end of the year, mill production will be curtailed because of annual repairs. The Milwaukee sheet mills of the Inland Steel Co. will shut down next Monday for at least two weeks.

Chicago delivered prices from mill are 3.25c. for No. 24 black; 2.55c. for No. 10 blue annealed; 4.10c. for No. 24 galvanized. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes	3.10c.
Mild steel bars	3.00c.
Reinforcing bars, billet steel	2.25c. to 2.60c.
Cold-finished steel bars and shafting—	
Rounds and hexagons	3.60c.
Flats and squares	4.10c.
Hoops	4.15c.
Bands	3.65c.
No. 24 black sheets	3.95c.
No. 10 blue annealed sheets	3.50c.
No. 24 galvanized sheets	4.80c.
Standard railroad spikes	3.55c.
Track bolts	4.55c.
Structural rivets	3.50c.
Boiler rivets	3.70c.

	Per Cent Off List
Machine bolts	50 and 5
Carriage bolts	47½
Coach or lag screws	55 and 5
Hot-pressed nuts, squares, tapped or blank,	3.25c. off per lb.
Hot-pressed nuts, hexagons, tapped or blank,	3.75c. off per lb.
No. 8 black annealed wire, per 100 lb	$3.30
Common wire nails, base per keg	3.05
Cement coated nails, base per keg	3.05

Bolts, Nuts and Rivets.—The general manufacturing trade is specifying at a fairly steady rate, but shipping orders from the railroads are smaller. First quarter contracting has been completed, and prices are showing a tendency to gain strength. The bolt, nut and rivet industry is closing the year with operations at close to 65 per cent of capacity.

Old Material.—Inquiry shows some life, but buyers appear to be only feeling out the market. Sales are small and at current prices. A large foundry in Chicago has taken a small tonnage of malleable and cast grades. A user is said to have offered $16.75 per gross ton, delivered, for re-rolling rails, but sales at that price are not reported. Activity in heavy melting steel is virtually at a standstill, although a dealer has succeeded in adding a few cars at $13.50 per gross ton, delivered, to an expiring contract. There is some inquiry for cast iron wheels, and two small sales have been made at $15 per gross ton, delivered. The carlot orders for machinery cast have been placed by a melter to the west of Chicago on the basis of $17 per net ton, delivered. Less material is being offered by the railroads, and there is a noticeable lessening in the rate at which cars of scrap are appearing on track. In the main, transactions in the Chicago scrap market are centered around dealers who are trading to cover old contracts. The Burlington is advertising a list of 4200 tons, and the Michigan Central is offering a blank list.

We quote delivered in consumers' yards, Chicago and vicinity, all freight and transfer charges paid for all items, except relaying rails, including angle bars to match, which are quoted f.o.b. dealers' yards:

	Per Gross Ton	
Heavy melting steel	$13.00 to	$13.50
Frogs, switches and guards, cut apart, and miscellaneous rails	14.50 to	15.00
Shoveling steel	13.00 to	13.50
Hydraulic compressed sheets	11.50 to	12.00
Drop forge flashings	9.50 to	10.00
Forged cast and rolled steel car-wheels	16.50 to	17.00
Railroad tires, charging box size	17.50 to	18.00
Railroad leaf springs, cut apart	16.50 to	17.00
Steel couplers and knuckles	15.50 to	16.00
Coil springs	17.25 to	17.75
Low phosphorus punchings	15.50 to	16.00
Axle turnings, foundry grade	13.00 to	13.50
Axle turnings, blast fur. grade	11.00 to	11.50
Relaying rails, 56 to 60 lb	25.50 to	26.50
Relaying rails, 65 lb. and heavier	26.00 to	31.00
Rerolling rails	16.00 to	16.50
Steel rails, less than 3 ft	16.25 to	16.75
Iron rails	13.50 to	14.00
Cast iron borings	9.50 to	10.00
Short shoveling turnings	9.50 to	10.00
Machine shop turnings	6.50 to	7.00
Railroad malleable	16.00 to	16.50
Agricultural malleable	15.00 to	15.50
Angle bars, steel	15.00 to	15.50
Cast iron carwheels	14.50 to	15.00
Per Net Ton		
No. 1 machinery cast	16.50 to	17.00
No. 1 railroad cast	15.50 to	16.00
No. 1 agricultural cast	15.50 to	16.00
Stove plate	14.00 to	14.50
Grate bars	13.50 to	14.00
Brake shoes	13.00 to	13.50
Iron angle and splice bars	14.00 to	14.50
Iron arch bars and transoms	18.75 to	19.25
Iron car axles	22.00 to	22.50
Steel car axles	17.00 to	17.50
No. 1 railroad wrought	12.00 to	12.50
No. 2 railroad wrought	11.50 to	12.00
No. 1 busheling	10.25 to	10.75
No. 2 busheling	6.25 to	6.75
Locomotive tires, smooth	16.00 to	16.50
Pipes and flues	9.00 to	9.50

Cold-Rolled Strip.—There is only a light demand, and prices are weak at 3c. to 3.40c., base Cleveland, or 3.30c. to 3.70c., delivered Chicago.

Wire Products.—Demand is light, but makers report that specifications for delivery after the first of the year are in fair volume. The manufacturing trade has held up better than that from jobbers during the holiday period. Mill operations, which last week were close to 50 per cent of capacity, have been reduced materially because of a two-day shut-down. Stocks in the hands of users are believed to be unusually small. An improvement in demand is looked for early in January, and mill stocks have been well rounded out to meet the expected increase. Prices of wire products are shown on page 1847.

Coke.—First quarter contract prices for by-product foundry coke are $9.75, local ovens, or $10.25, delivered

(*Concluded on page* 1863)

New York

Structural Prospects Good—Consumers Build Up Coke Stocks—Pig Iron Quiet

NEW YORK, Dec. 27.—Although the pig iron market is experiencing the usual holiday lull, sales in this district during the past week totaled between 5000 and 6000 tons. The Chrome Steel Works, Chrome, N. J., has closed against its inquiry for 1000 to 2000 tons of low phosphorus, and a Connecticut plant that was in the market for 1000 tons of high silicon foundry iron is reported to have placed its order with the New England furnace. Otherwise recent sales have been confined mainly to relatively small tonnages. Current inquiry is light, but melters are expected to take greater interest in the market after the first of next year. That there is still a fair amount of buying to be done for first quarter is indicated by the fact that several of the larger consumers have consistently adhered to a hand-to-mouth buying policy, not even deviating from it during the buying movement caused by the rise in the fuel market. The New York Central is inquiring for 360 tons for first quarter delivery to Frankfort, N. Y., and Elkhart, Ind. Included are 50 tons of No. 1 foundry, 175 tons of No. 2 plain, 50 tons of No. 2X, 50 tons of malleable, and 35 tons of 8 per cent silvery. The Port Henry, N. Y., furnace that has been undergoing repairs is scheduled to blow in today.

We quote per gross ton delivered in the New York district as follows, having added to furnace prices $1.39 to $2.52 freight from eastern Pennsylvania, $4.91 from Buffalo and $5.54 from Virginia:

East. Pa. No. 2 fdy., sil. 1.75 to 2.25	$23.39 to $24.52
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	23.89 to 25.02
East. Pa. No. 1X fdy., sil. 2.75 to 3.25	24.39 to 25.52
Buffalo fdy., sil. 1.75 to 2.25 (all rail)	22.91 to 23.91
No. 2 Virginia fdy., sil. 1.75 to 2.25	27.54 to 28.04

Ferroalloys.—It is estimated that close to 50,000 tons of ferromanganese has been contracted for by consumers for delivery in the first half of 1927. This is understood to include most of the large consumers, and the business is believed to have gone at $100, seaboard or furnace. There have been sales of carload and small lots to small consumers in the past week for delivery next year. Most consumers have closed contracts for next year's requirements of 50 per cent ferrosilicon and standard ferrochromium. The spiegeleisen market is very quiet, sales being confined to carload and small lots with some contracting for delivery in 1927.

Reinforcing Bars.—The market is quiet, with little business in prospect. A few scattered inquiries are before the market. Prices are unchanged at 2c., Pittsburgh, for lots of more than 100 tons and 2.10c. for small tonnages. Youngstown warehouses quote 2.50c., or 2.87½c., delivered New York, and local warehouses are holding to 3.15c., delivered at job.

Warehouse Business.—Purchases from stock are confined to small lots of a few hundred pounds of material. As the year draws to a close, there is a slight increase in the volume of small-lot buying, particularly in black and galvanized sheets. Sheet prices continue fairly firm, with only occasional concessions from the basis of 4.35c. per lb. for black and 5.10c. per lb. for galvanized. Structural steel purchasing has declined to a few tonnages for filling in on jobs nearing completion.

Finished Material.—The holiday season has brought the usual general lull in both sales and production. Some small orders for immediate delivery have been taken, but consumers are apparently not anxious to contract further for first quarter on the score of there being no prospect of higher prices. The ruling price on black sheets continues to be 3c., Pittsburgh, and no actual concession of more than $1 per ton for January delivery has been reported. In galvanized sheets some business has been closed during the week at 3.85c., Pittsburgh. Some small mills are taking orders of blue annealed sheets for delivery in the next three weeks at 2.25c., Pittsburgh, but 2.30c. is the price quoted by most companies. Although testing it is difficult in so quiet a market, it is generally stated that the price will be maintained after the first of the year. Cold-rolled strip continues to be in slight demand with prices going as low as 2.85c., Pittsburgh. Plates are firm at 1.90c., Pittsburgh, and most producers feel that December will be as good a month as November in point of production if not in sales. Bars are steady at 2c., Pittsburgh, and mills have enough work on their books to maintain fair rolling schedules well into January. The structural market is quiet, but some large projects may be placed in the last days of the year. The presence of a number of large inquiries is not serving to give the market strength, and competition is keen, particularly among fabricators. The Conley Tank Car Co. has purchased 100 tank cars from the American Car & Foundry Co., in addition to those placed a short time ago.

We quote mill shipments, New York delivery, as follows: Soft steel bars, 2.34c. per lb.; plates, 2.24c.; structural shapes, 2.34c.; bar iron, 2.24c.

Warehouse Prices, f.o.b. New York

	Base per Lb.
Plates and structural shapes	3.34c.
Soft steel bars and small shapes	3.24c.
Iron bars	3.24c.
Iron bars, Swedish charcoal	7.00c. to 7.25c.
Cold-finished steel shafting and screw stock—	
Rounds and hexagons	4.00c.
Flats and squares	4.50c.
Cold-rolled strip, soft and quarter hard	6.25c.
Hoops	4.49c.
Bands	3.99c.
Blue annealed sheets (No. 10 gage)	3.89c.
Long terne sheets (No. 24 gage)	5.80c.
Standard tool steel	12.00c.
Wire, black annealed	4.50c.
Wire, galvanized annealed	5.15c.
Tire steel, 1½ x ½ in. and larger	3.30c.
Smooth finish, 1 to 2½ x ¼ in. and larger	3.65c.
Open-hearth spring steel, bases	4.50c. to 7.00c.

	Per Cent Off List
Machine bolts, cut thread	40 and 10
Carriage bolts, cut thread	30 and 10
Coach screws	40 and 10

Boiler Tubes—	Per 100 Ft.
Lap welded steel, 2-in.	$17.33
Seamless steel, 2-in.	20.24
Charcoal iron, 2-in.	25.00
Charcoal iron, 4-in.	67.00

Discounts on Welded Pipe

Standard Steel—	Black	Galv.
½-in. butt	46	29
¾-in. butt	51	37
⅛-in. butt	53	39
2½-6-in. lap	48	35
7 and 8-in. lap	44	17
11 and 12-in. lap	37	12
Wrought Iron—		
½-in. butt	4	+19
¾-in. butt	11	+ 9
1-1½-in. butt	14	+ 6
2-in. lap	6	+14
3-6-in. lap	11	+ 6
7-12-in. lap	3	+16

Tin Plate (14 x 20 *in.*)

	Prime	Seconds
Coke, 100 lb. base box	$6.45	$6.20
Charcoal, per box—	A	AAA
IC	$9.70	$12.10
IX	12.00	14.25
IXX	13.90	16.00

Terne Plate (14 x 20 *in.*)

IC—20-lb. coating	$10.00 to $11.00
IC—30-lb. coating	12.00 to 13.00
IC—40-lb. coating	13.75 to 14.25

Sheets, Box Annealed—Black, C. R. One Pass

	Per Lb.
Nos. 18 to 20	4.15c.
No. 22	4.30c.
No. 24	4.35c.
No. 26	4.45c.
No. 28*	4.60c.
No. 30	4.85c.

Sheets, Galvanized

	Per Lb.
No. 14	4.50c. to 4.75c.
No. 16	4.60c. to 4.85c.
No. 18	4.75c.
No. 20	4.90c.
No. 22	4.95c.
No. 24	5.10c.
No. 26	5.35c.
No. 28*	5.60c.
No. 30	6.00c.

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

Cast Iron Pipe.—There is active purchasing of small lots of water and gas pipe, and a large total tonnage of gas pipe business is before the market. Of the pipe for the Boston Consolidated Gas Co. about 3000 tons went to the Warren Foundry & Pipe Co. and about 2000 tons is reported to have been placed with the Donaldson Iron Co. Boston opens bids Dec. 30 on about 3000 tons of water pipe. Gas pipe inquiries of the United Gas Improvement Co., the Consolidated Gas Co. and the Brooklyn Union Gas Co. have not yet been placed. Prices continue soft, with $1 to $2 concessions freely offered for winter delivery.

We quote pressure pipe per net ton, f.o.b. New York in carload lots, as follows: 6-in. and larger, $48.60 to $50.60; 4-in. and 5-in., $53.60 to $55.60; 3-in., $63.60 to $65.60; with $5 additional for Class A and gas pipe.

Coke.—The market is moderately active, with large consumers who have sufficient storage space building up fair-sized stocks in anticipation of a possible coal strike. Such buying, however, is not large and consists principally of taking desirable distress tonnages that appear on the market. Prices both of foundry and furnace grade continue about the same, with $4.50 to $5 per net ton, Connellsville, the range on spot shipment foundry and $3.50 to $4 on spot furnace. Delivered prices of Connellsville foundry are: To northern New Jersey, $8.53 to $9.03 per ton; New York or Brooklyn, $9.29 to $9.79; Newark and Jersey City, N. J., $8.41 to $8.91 per ton. By-product foundry coke is unchanged at $10.59 to $11.77 per ton, delivered Newark or Jersey City, N. J.

Old Material.—Activity is confined to occasional purchases of small lots of material for shipment on old contracts. No. 1 heavy melting steel is being purchased at $15.50 per ton, delivered, and a fair tonnage of blast furnace scrap is moving to eastern Pennsylvania consumers. The market, as a whole, is quiet as a result of the holidays, and prices are unchanged, business being too small to cause much fluctuation. Little or no change in the present situation is expected until after the holidays are past and the new year is begun.

Buying prices per gross ton, New York, follow:

Heavy melting steel (yard)	$9.25 to $9.75
Heavy melting steel (railroad or equivalent)	11.75 to 12.85
Rails for rolling	12.50 to 13.00
Steel car axles	18.50 to 19.00
Iron car axles	24.00 to 24.50
No. 1 railroad wrought	13.00 to 14.00
Forge fire	9.25 to 9.75
No. 1 yard wrought, long	12.00 to 13.00
Cast borings (steel mill)	9.25 to 9.75
Cast borings (chemical)	13.00 to 13.50
Machine shop turnings	9.25 to 9.75
Mixed borings and turnings	9.25 to 9.75
Iron and steel pipe (1 in. diam., not under 2 ft. long)	9.75 to 10.25
Stove plate (steel mill)	9.25 to 9.75
Stove plate (foundry)	11.00 to 11.50
Locomotive grate bars	10.25 to 10.75
Malleable cast (railroad)	15.50 to 16.00
Cast iron carwheels	12.00 to 12.50
No. 1 heavy breakable cast	11.75 to 13.00

Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:

No. 1 machinery cast	$16.00 to $16.50
No. 1 heavy cast (columns, building materials, etc.), cupola size	14.50 to 15.00
No. 2 cast (radiators, cast boilers, etc.)	13.50 to 14.00

Warehouse Prices, f.o.b. Cleveland

	Base per Lb.
Plates and structural shapes	3.00c.
Mild steel bars	3.00c.
Cold-finished rounds and hexagons	3.90c.
Cold-finished flats and squares	4.40c.
Hoops and bands	3.65c.
No. 24 black sheets	3.80c.
No. 10 blue annealed sheets	3.25c.
No. 24 galvanized sheets	4.55c. to 4.65c.
No. 9 annealed wire, per 100 lb	$3.00
No. 9 galvanized wire, per 100 lb	3.45
Common wire nails, base, per keg	3.00

Cleveland

Steel Buying by Motor Car Builders Still Cautious—Pig Iron Declines

CLEVELAND, Dec. 27.—Sentiment in the steel industry and among consumers is generally optimistic, and mills look for a fair volume of business next month. While the market is affected by the holiday season, a moderate amount of business continues to come out in small-lot orders for January shipment. Steel bars, plates and pipe are among the more active items. Neither buyers nor sellers are showing interest in first quarter contracts.

Orders from the automotive industry show some gain over earlier in the month. While motor car builders are talking optimistically of the 1927 outlook, they are buying sparingly and only for early requirements. It is not expected that this industry will do much toward increasing its production schedules until after the New York and Chicago automobile shows. The volume of orders placed by dealers during these shows will give some indication of what manufacturers may expect in spring business.

The Akron, Canton & Youngstown Railway has placed 3000 tons of rails and track supplies with the Carnegie Steel Co., and the Chesapeake & Hocking Railway Co., which will build 85 miles of track in Ohio, will supplement its recent purchase with 5500 tons additional, for which it has sent out an inquiry. It is also in the market for tie plates, switches, frogs and track bolts for the new line.

In the structural field considerable work is still pending, but new inquiry is light. Prices are unchanged. Outside mills are holding to 2c. Pittsburgh, for steel bars, although a local mill continues to quote 1.90c. to 2c., Cleveland, for small sizes. All plate sales are on a 1.90c., Pittsburgh, base, and structural material is firm at 2c., Pittsburgh.

Pig Iron.—Sales were light during the week and, with the exception of 1000 tons of foundry iron, were confined to small lots. Very few foundries in this territory have covered for the first quarter. Some buying for that delivery is expected early in the month, although there is a disposition among many consumers to buy only for early requirements. Cleveland producers have met the price situation that has developed from the reduction to $18.50 on foundry iron in the Valley district and are quoting that price for outside shipment. For Cleveland delivery one local producer has marked its price down $1 a ton to $19 furnace, and to meet this price Valley furnaces would have to go to $17.75. Another Cleveland producer is quoting $19.50. One Lake interest is holding to $19 as a minimum.

Quotations below are per gross ton and except on basic and low phosphorus iron, are delivered Cleveland, including a 50c. switching charge for local iron. Ohio silvery and Southern iron prices are based on a $3.00 freight rate from Jackson and $6.01 from Birmingham:

Basic, Valley furnace	$18.50
N'th'n No. 2 fdy., sil. 1.75 to 2.25	$19.50 to 20.00
Southern fdy., sil. 1.75 to 2.25	26.01
Malleable	19.50 to 20.00
Ohio silvery, 8 per cent	31.50
Standard low phos., Valley furn.	28.00

Semi-Finished Steel.—The demand for sheet bars has improved, as some of the mills are placing orders for January shipment, and a local mill has started up three additional open-hearth furnaces and is now operating nine. Buying is still largely of a hand-to-mouth character. No deviation is reported from the quotations that have prevailed through the present quarter.

Sheets.—Some good-sized orders for automobile body sheets were placed during the week, and the demand for other grades shows a slight improvement, as consumers have low stocks and are placing tonnage for January shipment. Prices show little change. Some of the mills will not go below 3c., Pittsburgh, on black sheets, although others are quoting 2.90c. for the common grades and heavier gages. On galvanized sheets quotations of 3.80c., Ohio mill, are reported. On blue

annealed sheets there is a range of 2.25c. to 2.30c., Pittsburgh.

Cold-Rolled Strip Steel.—There is a little improvement in the demand from the automotive industry, but orders are confined to small lots for early requirements, so that mills have little business ahead. Although prices are untested, the market appears to be holding to 3c., Cleveland, for regular stock and to 2.90c. for tube stock, with small lots bringing higher prices.

Reinforcing Bars.—Several good-sized inquiries previously reported are still pending. Prices are untested, although mills are holding to 2c., Pittsburgh, for billet steel bars in small lots and to 1.75c. to 1.80c., mill, for rail steel bars.

Warehouse Business.—Jobbers are feeling the effects of the holiday lull and are getting few orders. With the exception of irregularity in sheets, prices are holding well. One jobber has reduced galvanized sheets $2 a ton.

Bolts, Nuts and Rivets.—The demand for bolts and nuts has improved, as jobbers and manufacturers in some lines are placing specifications for January shipment. Business from the automotive industry is still light. Rivet business is fair.

Coke.—Very little interest is being shown in the market, and prices are unchanged at $4.50 to $5.50, ovens, for standard Connellsville foundry coke for prompt shipment, and $5.50 to $6.50, ovens, for contracts. Heating coke ranges from $3 to $3.25, ovens.

Old Material.—The market shows a somewhat firmer tone, as dealers prefer to hold their scrap until next month rather than to sell it at recent prices. A Cleveland mill has released shipments on a limited tonnage of heavy melting steel, for which dealers are paying $14.50 to $14.75 for No. 1 grade. There is also some demand for blast furnace scrap to fill old orders, and up to $11.50 is being offered for this grade. No new inquiry is coming from the mills and no buying is expected until next month.

We quote per gross ton delivered consumers' yards in Cleveland:

Heavy melting steel No. 1	$14.25 to $14.75
Heavy melting steel No. 2	14.00 to 14.25
Rails for rolling	16.25 to 16.50
Rails under 3 ft	16.50 to 17.00
Low phosphorus billet, bloom and slab crops	18.00 to 18.50
Low phosphorus sheet bar crops	16.50 to 17.00
Low phosphorus plate scrap	16.00 to 16.50
Low phosphorus forging crops	16.50 to 17.00
Cast iron borings	11.00 to 11.50
Machine shop turnings	9.00 to 9.25
Mixed borings and short turnings	11.00 to 11.50
Compressed sheet steel	13.50 to 14.00
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	14.00 to 14.50
Railroad malleable	16.50 to 17.00
Light bundled sheet stampings	12.00 to 12.50
Steel axle turnings	12.50 to 13.00
No. 1 cast	16.00 to 16.50
No. 1 busheling	12.00 to 12.50
No. 2 busheling	11.00 to 11.50
Drop forge flashings, 15 in. and under	11.50 to 12.00
Railroad grate bars	12.00 to 12.50
Stove plate	12.00 to 12.50
Pipes and flues	10.00 to 10.50

Warehouse Prices, f.o.b. Philadelphia

	Base per Lb.
Tank steel plates, ¼-in. and heavier	2.80c. to 3.00c.
Tank steel plates, ⅜-in.	3.00c. to 3.20c.
Structural shapes	2.75c. to 3.00c.
Soft steel bars, small shapes and iron bars (except bands)	3.00c. to 3.20c.
Round-edge iron	3.50c.
Round-edge steel, iron finished, 1½ x 1½ in.	3.50c.
Round-edge steel, planished	4.30c.
Reinforcing steel bars, square, twisted and deformed	3.00c.
Cold-finished steel, rounds and hexagons	4.00c.
Cold-finished steel, squares and flats	4.50c.
Steel hoops	4.00c. to 4.25c.
Steel bands, No. 12 gage to ⅛-in., inclusive	3.75c. to 3.90c.
Spring steel	5.00c.
No. 24 black sheets	4.35c.
No. 10 blue annealed sheets	3.50c.
No. 24 galvanized sheets	5.30c.
Diamond pattern floor plates—	
¼-in.	5.30c.
⅜-in.	5.50c.
Rails	3.20c.
Tool steel	8.50c.
Swedish iron bars	6.60c.

Philadelphia

Prices Stationary As Year Closes—Business Volume Little Changed

PHILADELPHIA, Dec. 27.—No marked trend has developed in the past week to indicate new year prospects. The pig iron and scrap markets remain dull, with prices unchanged, while in steel volume there is a slight change for the better in that a considerable number of consumers who have been buying sparingly during the last few weeks have sent in orders or specifications against contracts covering shipments to be made in January. Some of the steel companies selling in this district probably will book more business in December than the orders of the first half of the month indicated. Otherwise there is a lack of developments. With the exception of prices on sheets and cold-rolled strip steel, which are still slightly irregular, quotations for first quarter show no change from those in effect during this quarter.

Pig Iron.—So little inquiry has come to local sales offices in the past week that the pig iron market has had no real test. A moderate number of sales of lots of foundry iron ranging from a carload up to 100 tons have been made, and prices on these have usually been $22, furnace, for the base grade, but in a few instances $22.25 and $22.50, furnace, have been obtained. A steel company which has been inquiring for 5000 to 10,000 tons of basic iron has not yet bought, but quotations ranging from $21.50 to $22, furnace, are said to have been made. Copper bearing low phosphorus iron has been sold by a nearby furnace at $25, furnace. A good many users of foundry iron have not yet covered in full for their first quarter requirements, but seem in no haste to do so. A fairly large consumer in the Baltimore district is considering the purchase of 5000 tons for second quarter, but no formal inquiry has been sent out.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rates varying from 76c. to $1.63 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$22.76 to $23.26
East. Pa. No. 2X, 2.25 to 2.75 sil.	23.26 to 23.76
East. Pa. No. 1X	23.76 to 24.26
Basic delivered eastern Pa.	22.00 to 23.00
Gray forge	22.50 to 23.00
Malleable	23.50 to 24.00
Standard low phos. (f.o.b. New York State furnace)	24.00 to 25.00
Copper bearing low phos. (f.o.b. furnace)	25.00 to 26.00
*Virginia No. 2 plain, 1.75 to 2.25 sil.	27.67 to 28.67
*Virginia No. 2X, 2.25 to 2.75 sil.	28.17 to 29.17

*The freight rate from Virginia furnaces to Philadelphia is $5.17 per gross ton.

Ferroalloys.—A fairly satisfactory business in ferromanganese is still being done by the two Eastern producers, who now have good order books for first half. No sales of English ferromanganese are reported. Prices continue at $100, seaboard, for domestic or foreign alloy.

Billets.—Occasional sales of a few heats of forging steel are being made, but generally the demand for semi-finished steel is light. Quotations remain unchanged at $35, Pittsburgh, for rerolling billets and $40, Pittsburgh, for forging billets.

Plates.—Some of the Eastern plate mills continue to operate at 50 to 60 per cent of capacity. While there is no buying of importance, the day-to-day run of orders, many of them small, is enough to maintain this rate of operation, which has remained about the same for some time. Included in the past week's specifications were several hundred tons for locomotive work. Quotations remain at 1.90c., Pittsburgh.

Structural Material.—There has been a let-down over the Christmas holiday period in awards of and inquiries for structural steel. An award is expected momentarily of 10,500 tons for the Convention Hall at Atlantic City, the low bidders being the American Bridge Co. and the McClintic-Marshall Co. Orders for plain material are in slightly better volume, but East-

ern mills are operating at considerably less than capacity, some averaging not more than 50 per cent. In the competition for business both by fabricators and the mills prices on both fabricated steel and plain material have been cut. In exceptional cases plain material has been sold at about 1.80c., Pittsburgh, but prices on the general run of smaller orders range from 1.90c. to 2c., Pittsburgh.

Bars.—Orders for steel bars for January shipment have come to steel company sales offices a little more freely in the past week, but there is a great deal of idle bar mill capacity for which there seems to be no tonnage in sight. In keeping with the falling off in specifications for merchant bars by manufacturers and jobbers the awards of concrete reinforcing steel have dropped considerably. Bar iron is quoted by Eastern makers at 2.22c., Philadelphia.

Sheets.—With buying at a low rate, there has been less price competition on sheets. Concessions are given sporadically, but the majority of sales are at 2.30c. to 2.40c. for blue annealed, 3c. for black and 3.85c. for galvanized, Pittsburgh base.

Imports.—In the week ended Dec. 25 only 350 tons of pig iron came in from abroad at Philadelphia, all from the Netherlands. Other imports were: 7226 tons of manganese ore from British West Africa, 2900 tons of chrome ore from Portuguese Africa, 197 tons of iron ore from Spain, 533 tons of iron ore from Germany, 49 tons of steel alloys from Switzerland, 60 tons of wire rods from Germany, 25 tons of lapweld tubes from Germany.

Old Material.—A purchase of 8000 to 10,000 tons of heavy melting steel by an Eastern steel company did not strengthen the market. This company paid $15.75, delivered, which is the average of the quotations of $15.50 to $16 which THE IRON AGE has published for several weeks as representative of the eastern Pennsylvania market. Another steel company bought several thousand tons of bundled sheets and machine shop turnings at $13, delivered. No. 1 forge fire has been sold at $13.50. Other grades are quiet, and prices are unchanged.

We quote for delivery, consuming points in this district, as follows:

No. 1 heavy melting steel	$15.50 to $16.00
Scrap rails	15.50 to 16.00
Steel rails for rolling	17.00 to 17.50
No. 1 low phos., heavy, 0.04 per cent and under	20.00 to 21.00
Couplers and knuckles	18.50
Rolled steel wheels	18.50
Cast iron carwheels	16.50 to 17.00
No. 1 railroad wrought	17.00 to 17.50
No. 1 forge fire	13.00 to 13.50
Bundled sheets (for steel works)	13.00
Mixed borings and turnings (for blast furnace)	12.50 to 13.00
Machine shop turnings (for steel works)	13.00
Machine shop turnings (for rolling mill)	13.00 to 13.50
Heavy axle turnings (or equivalent)	14.00 to 14.50
Cast borings (for steel works and rolling mill)	13.50
Cast borings (for chemical plant)	15.00 to 16.00
No. 1 cast	17.00 to 17.50
Heavy breakable cast (for steel works)	16.00 to 16.50
Railroad grate bars	13.00 to 13.50
Stove plate (for steel works)	13.00 to 13.50
Wrought iron and soft steel pipes and tubes (new specifications)	14.00 to 14.50
Shafting	21.00 to 22.00
Steel axles	23.00 to 24.00

The decision recently handed down by the United States Supreme Court in the case of the General Electric Co. holds that the owner of an article patented or otherwise is not violating the common law or the anti-trust law by seeking to dispose of his articles directly to the consumer and fixing the price by which his agents transfer the title from him directly to such consumer. The Court affirms the right of a patentee to license "another to make and vend" and to fix the price at which the licensee will sell the patented product.

Holiday Dullness in Canadian Scrap Market

TORONTO, ONT., Dec. 27.—Trading in iron and steel scrap in the Canadian markets has reverted to a state of stagnation. This is due to the holiday season. Many consumers have only light stocks of scrap on hand, and it is believed that some good business will develop early in January. Inquiries have been received for heavy melting steel and machinery cast for first quarter delivery, but the placing of contracts has not been general either in the Toronto or Montreal districts. Shipments against contracts have been going forward on schedule, and this business, together with a few small spot orders, has accounted for most of the market activity in the past week. Dealers' buying prices are firm as follows:

	Toronto	Montreal
Per Gross Ton		
Steel turnings	$8.50	$8.00
Machine shop turnings	8.50	7.00
Wrought pipe	6.00	6.00
Rails	11.00	10.00
No. 1 wrought	11.00	14.00
Heavy melting steel	11.00	9.00
Steel axles	16.00	17.00
Axles, wrought iron	18.00	19.00
Boiler plate	10.00	8.00
Heavy axle turnings	9.00	8.50
Cast borings	8.50	7.50
Per Net Ton		
Standard carwheels	15.00	16.00
Malleable	14.00	14.00
Stove plate	10.00	13.00
No. 1 machinery cast	16.00	18.00

British Losses in Iron and Steel Plant Operations

Some of the results of the coal strike are showing up in reports of British iron and steel plants, several of which cover a year ended Sept. 30, of which five months represent coal stoppage. Bolckow, Vaughan & Co., Ltd., showed a loss of £178,085, after interest, no dividends having been paid. Dorman, Long & Co., Ltd., showed a loss of £312,253, with payment of part of the accrued preferred dividend. The Cargo Fleet Iron Co., Ltd., had a loss of £37,230, and paid no dividends. The South Durham Steel & Iron Co., Ltd., reported a loss of £66,691, but paid the full preferred dividend and 5 per cent, in place of the usual 10 per cent, on common stock.

Baldwin's, Ltd., showed a profit of £11,168, but paid no dividends, being already behind to the extent of half the 1924-25 preferred payment. The United Steel Cos., Ltd., reported a loss of £303,003, and paid no dividends. The foregoing figures are from the (London) *Economist*.

Directory of German Exporters Published

The publishers of *Deutschlands Exporthandel* (Germany's Export Trade), Berlin-Charlottenburg 2, Berliner Strasse 40, Germany, have issued a directory of German exporters for free distribution among those interested in effecting business relations with German firms. The directory includes thousands of the names of outstanding German companies engaged in export trade and is classified according to different branches of industry. The directory will be delivered without obligation to any firm indicating that it has a real need for it.

Net earnings of the Gulf States Steel Co., Birmingham, for the last quarter, based upon October and November results, will be in excess of the 90c. shown on the 125,000 shares of common stock during the third quarter, and the company is expected to earn close to the full year's dividend of $5 per share on its common stock. In the nine months ended Sept. 30 net earnings totaled $3.67 a common share, while results for all of 1925 were $7.19 a share.

San Francisco

Bridge Takes 3100 Tons of Shapes—1079 Tons of Cast Pipe Placed

SAN FRANCISCO, Dec. 24 (*By Air Mail*).—Outstanding developments of the week have been a letting for a bridge in Idaho calling for 3100 tons of fabricated steel, which was taken by the Wallace Bridge & Structural Steel Co., Seattle, Wash.; an award by the city of Glendale, Cal., of 1079 tons of cast iron pipe, which was divided between two domestic makers, and a withdrawal of quotations on reinforcing bars by local bar jobbers.

In Lovelock, Nev., a referendum on a bond issue of $1,287,000 for a proposed dam for the Lovelock Irrigation District resulted favorably for the proponents of the project. Included in the material that will be required for this is 18,000 ft. of steel sheet piling—72 to 450 tons, depending on the weight specified. In Phoenix, Ariz., C. E. Griggs, consulting engineer, is preparing plans for the construction of a dam, canals and laterals for the San Pedro Municipal Irrigation District, which proposes to irrigate 35,000 acres of land in the San Pedro Valley, Ariz. The estimated cost of this project is $3,500,000, and a referendum on a bond issue will be held shortly after the first of the new year.

In Texas City, Tex., plans are being prepared by the engineering department of the Humble Oil & Refining Co. for the construction of a 12-in. cast iron pipe line from the oil fields in Panhandle, Tex., to terminals at Texas City and Baytown, Tex. The estimated cost of this work is $8,500,000. The engineering departments of the Gulf Pipe Line Co. and of the Magnolia Pipe Line Co., Ranger, Tex., are preparing plans for the construction of a pipe line, 18 in. to 24 in. in diameter, from Ranger to Panhandle and other points in Carson County, Tex. The estimated cost of these projects is $4,000,000.

Pig Iron.—Little business of importance has been transacted during the week. First quarter bookings have been practically completed. The amount of foundry iron specified by Pacific Coast users for early 1927 is understood to be less than the amount ordered for the first quarter of this year. Quotations are unchanged.

	Per Gross Ton
*Utah basic	$25.00 to $26.00
*Utah foundry, sil. 2.75 to 3.25	25.00 to 26.00
**Indian foundry, sil. 2.75 to 3.25	25.00
**German foundry, sil. 2.75 to 3.25	24.25

*Delivered San Francisco.
**Duty paid, f.o.b. cars San Francisco.

Shapes.—The only letting of 100 tons or over known to have been closed during the week is 3100 tons for a bridge in Idaho, mentioned above. Fresh inquiry calls for 1225 tons. The largest individual project is an apartment building in San Francisco, requiring 450 tons. Eastern mills continue to quote plain material at 2.35c., c.i.f. Coast ports.

Plates.—Leading the plate awards of the week is 250 tons for a pipe line for the East Bay Water Co., Oakland, Cal. This letting calls for ¼-in. diameter pipe and was taken by the Western Pipe & Steel Co., San Francisco. About 650 tons of 3/16-in. diameter pipe for the same buyer is still pending. The Standard Oil Co. of California, San Francisco, is inquiring for 400 tons. Bids have closed on 1800 tons for tank work for the Shell Oil Co. This is an inquiry that has been pending for some time. Eastern mills quote plates at 2.30c., c.i.f. Coast ports.

Bars.—Local bar jobbers have withdrawn their quotations on reinforcing bars, and it is understood that higher prices will be named early in the coming week. Recent lettings have exceeded 700 tons, and fresh inquiry calls for about 400 tons. The largest individual award, 500 tons, for a warehouse in San Francisco was taken by a local jobber.

Cast Iron Pipe.—Glendale, Cal., awarded 1079 tons as follows: 561 tons of 8 and 12-in. Class B and 110 tons of 12-in. Class D pipe to the National Cast Iron Pipe Co., and 408 tons of 16 and 20-in. Class B pipe to the American Cast Iron Pipe Co. At a referendum in Monterey Park, Cal., a bond issue of $180,000 was indorsed for water system improvements, for which about 1200 tons of cast iron pipe will be required. El Centro, Cal., is inquiring for 108 tons of 6 and 8-in. Class B pipe, and Santa Barbara, Cal., will take bids, Jan. 4, on 217 tons of 6, 8, 12 and 16-in. Class B and 6-in. Class C pipe. Quotations are unchanged at $49 to $50 base, f.o.b. dock, San Francisco.

Warehouse Business.—Inventory taking will begin immediately after Christmas, and little new business is likely to develop until the second week of the new year. Quotations are unchanged.

Coke.—A local importer expects a shipment of by-product coke from Germany in January, most of which has been sold. No quotations on fuel for future delivery are being made.

Warehouse Prices, f.o.b. San Francisco

	Base per Lb.
Plates and structural shapes	3.30c.
Mild steel bars and small angles	3.30c.
Small channels and tees, ¾-in. to 2¾-in.	3.90c.
Spring steel, ¼-in. and thicker	5.00c.
No. 24 black sheets	4.90c.
No. 28 black sheets	5.15c.
No. 10 blue annealed sheets	4.00c.
No. 24 galvanized sheets	5.65c.
No. 28 galvanized sheets	6.15c.
Common wire nails, base per keg	$3.75
Cement coated nails, 100-lb. keg	3.75
Cement coated nails, count keg	3.00

Birmingham

Foundries Resume Slowly—Steel Output Stopped for Only Three Days

BIRMINGHAM, Dec. 27.—With the resumption of activities among foundries this week, the demand for pig iron is expected to sustain the operation of those blast furnaces that are still in blast. The banking of fires at two blast furnaces and the blowing out of a third has prevented increases in surplus stocks on producers' yards. Moreover, many of the important melters have very little iron in stock so that with the completion of inventories fresh buying is looked for. Current inquiries, though not numerous, indicate that buying will remain on a hand-to-mouth scale. Cast iron pressure pipe makers have been operating at a low ebb for the past few weeks, but they are still in need of some iron. Stove manufacturers have been producing at a steady gait. In general, foundries are resuming operations slowly, but with the turn of the year it is anticipated that pig iron melt will have returned to about normal.

We quote per gross ton, f.o.b. Birmingham district furnaces, as follows:

No. 2 foundry, 1.75 to 2.25 sil	$20.00
No. 1 foundry, 2.25 to 2.75 sil	20.50
Basic	20.00
Charcoal, warm blast	30.00

Rolled Steel.—Open-hearth furnaces and many of the finishing mills and fabricating shops have resumed operations after a lay-off of three days, including Sunday. Production promises to be back to what it was last week and last month within another 24 hr. Sales of rails and track accessories have been in good volume, and the lighter forms of finished steel are in better demand. The Warrior River barge service is booked not only for this week but for all of next month for shipments of rails, concrete bars and other steel products. Rails for the Southeast will be shipped via Mobile by water to the Florida coast.

Cast Iron Pipe.—Production of cast iron pressure pipe has been suspended since last Thursday, but plans call for a resumption, more or less full, by the beginning of next week. Virtually no pipe stock is on hand, and raw material supplies are low. The few lettings

during December are expected to sustain at least restricted operations until winter business comes in. Pressure pipe still ranges from $36 to $37 per net ton, Birmingham, for 6-in. and larger diameters.

Coke.—Production was maintained during the holiday season, although not on so broad a scale as a few weeks ago. There is no pressure for heavier output, but the market is considered firm. Foundry coke is held at $5.50 per net ton, Birmingham. Some contracts for coke still have three to six months to run. Coal production in Alabama stopped Thursday evening and was resumed Monday morning of this week with a normal force expected in the mines by Wednesday or Thursday. Production has been extraordinarily heavy in Alabama, output for the week ended Dec. 4 totaling 450,000 tons and that for the week ended Dec. 11, 452,000 tons, the record week's production of the year. Annual output promises to be larger than estimated a month ago. The last week of the year will probably show an output of more than 350,000 tons.

Old Material.—Large quantities of heavy melting steel are moving to consumers, and there is no hesitation either in accepting or shipping material. Dealers are being kept busy preparing and moving scrap. Prices remain low and weak, with no prospects of improvement in the near future. Dealers are able to secure all the stock that they can handle.

We quote per gross ton, f.o.b. Birmingham district yards, as follows:

Cast iron borings, chemical	$15.00 to $16.00
Heavy melting steel	13.00 to 14.00
Railroad wrought	11.00 to 12.00
Steel axles	17.00 to 18.00
Iron axles	17.00 to 18.00
Steel rails	13.00 to 14.00
No. 1 cast	16.00 to 17.00
Tramcar wheels	16.50 to 17.50
Carwheels	16.00 to 16.50
Stove plate	14.00 to 14.50
Machine shop turnings	8.00 to 8.50
Cast iron borings	8.00 to 8.50
Rails for rolling	15.00 to 16.00

St. Louis

Carwheel Maker Wants 3000 Tons of Pig Iron—Scrap Stronger

ST. LOUIS, Dec. 27.—The usual Christmas holiday lull rules in the pig iron market. Sales of the St. Louis Coke & Iron Corporation for the week totaled approximately 1500 tons. The tonnage was well scattered throughout the territory, the largest order being 500 tons. The principal inquiry is that of the Standard Sanitary Mfg. Co., Louisville, calling for approximately 18,000 tons. A carwheel maker is in the market for 3000 tons. Shipments are moving only in moderate proportions, as melters are anxious to hold down inventories. Prices are unchanged.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices $2.16 freight from Chicago, $4.42 from Birmingham, all rail, and 81c. average switching charge from Granite City:

Northern fdy., sil. 1.75 to 2.25	$22.16
Northern malleable, sil. 1.75 to 2.25	22.16
Basic	22.16
Southern fdy., sil. 1.75 to 2.25	24.42
Granite City iron, sil. 1.75 to 2.25	$22.31 to 22.81

Warehouse Prices, f.o.b. St. Louis

	Base per Lb.
Plates and structural shapes	3.25c.
Bars, mild steel or iron	3.15c.
Cold-finished rounds, shafting and screw stock	3.75c.
No. 24 black sheets	4.45c.
No. 10 blue annealed sheets	3.60c.
No. 24 galvanized sheets	5.25c.
Black corrugated sheets	4.65c.
Galvanized corrugated sheets	5.30c.
Structural rivets	3.65c.
Boiler rivets	3.85c.
	Per Cent Off List
Tank rivets, 7/8-in. and smaller	70
Machine bolts	50 and 5
Carriage bolts	47½
Lag screws	55 and 5
Hot-pressed nuts, square, blank or tapped	3.25c. off per lb.
Hot-pressed nuts, hexagons, blank or tapped	3.75c. off per lb.

Coke.—The only change in the coke situation is that there has been a slightly stronger demand for domestic grades because of colder weather. Consumers of foundry grades are taking only immediate requirements.

Finished Iron and Steel.—The demand for sheets and plates has fallen off considerably, and the local mill is operating at only about 65 per cent of capacity. However, there seems to be a better feeling in the trade, and it is expected that some heavy contracts now under consideration for first quarter delivery will be closed soon. Prices are surprisingly steady in view of the lack of business, and there has been little price cutting. A local manufacturer of building specialties will shortly receive the last of three shipments of bar-size shapes from a Belgian mill, the total order calling for about 400 tons. The material that has been received is said to have been badly bent and twisted on its arrival. The structural steel business is experiencing the usual holiday quietness.

Old Material.—The market is stronger and prices are higher, for no other reason than that dealers believe that the mills will come into the market after the first of the year and will pay more for the material that they buy. The mills are still refraining from buying, and stocks in their hands are heavy. Railroad lists include: Missouri Pacific, 6000 tons; Union Pacific, 2100 tons; Chicago, Burlington & Quincy, 4300 tons, and St. Louis-San Francisco, 500 tons.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton	
Iron rails	$11.00 to $11.50
Rails for rolling	15.50 to 16.00
Steel rails less than 3 ft.	16.00 to 16.50
Relaying rails, 60 lb. and under	20.50 to 23.50
Relaying rails, 70 lb. and over	26.50 to 29.00
Cast iron carwheels	14.50 to 15.00
Heavy melting steel	13.00 to 13.50
Heavy shoveling steel	13.00 to 13.50
Frogs, switches and guards cut apart	14.50 to 15.00
Railroad springs	15.50 to 16.00
Heavy axle and tire turnings	10.50 to 11.00
No. 1 locomotive tires	16.25 to 16.75
Per Net Ton	
Steel angle bars	12.25 to 12.75
Steel car axles	17.25 to 17.75
Iron car axles	20.50 to 21.00
Wrought iron bars and transoms	18.00 to 18.50
No. 1 railroad wrought	10.75 to 11.25
No. 2 railroad wrought	11.75 to 12.25
Cast iron borings	9.00 to 9.50
No. 1 busheling	10.25 to 10.75
No. 1 railroad cast	14.25 to 14.75
No. 1 machinery cast	16.75 to 17.25
Railroad malleable	12.50 to 13.00
Machine shop turnings	6.25 to 6.75
Bundled sheets	8.00 to 8.50

Boston

Pig Iron Buying Fair for Holiday Week—Boston to Buy Pipe

BOSTON, Dec. 27.—Notwithstanding the natural slowing up in foundry activities during Christmas week, local pig iron houses succeeded in digging up business for first quarter delivery. Orders ran in size from car lots up to 300 tons, mostly 100 tons or less, with Buffalo and New York State furnaces and the Mystic Iron Works again taking the bulk of business. Buffalo iron is still available at $18 a ton, base furnace, but business is being put through at $19 in a small way. New York State furnaces are meeting the delivered Buffalo price, and that is true of the Mystic Iron Works. There is no open inquiry in the market. It is believed, however, business will improve immediately following Jan. 1, inasmuch as numerous foundries have signified their intentions of covering first, as well as second quarter, requirements.

We quote delivered prices per gross ton to most New England points as follows, having added $3.65 freight from eastern Pennsylvania, $4.91 from Buffalo, $5.92 from Virginia, and $6.91 to $8.77 from Alabama:

East. Penn., sil. 1.75 to 2.25	$25.65 to $26.15
East. Penn., sil. 2.25 to 2.75	26.15 to 26.65
Buffalo, sil. 1.75 to 2.25	22.91 to 23.91
Buffalo, sil. 2.25 to 2.75	23.41 to 24.41
Virginia, sil. 1.75 to 2.25	28.42 to 29.92
Virginia, sil. 2.25 to 2.75	28.92 to 30.42
Alabama, sil. 1.75 to 2.25	26.91 to 28.77
Alabama, sil. 2.25 to 2.75	27.41 to 29.27

Finished Material.—The closing days of the year find consumers' specifications against last quarter contracts for structural steel, plates, bars and sheets slightly larger than during the first part of December. Standard shapes are reported as firm on a basis of 2c., base Pittsburgh, plates at 1.90c. and bars at 2c. The Navy Yard, Charlestown, Boston, is in the market for a small tonnage of steel bars, sheets, angles and bolts. The following awards have been made by Boston on various materials for which bids closed in the past week: 78,800 rail clips and about 157,200 lb. of screw spikes to Storms Drop Forgings Co., Springfield, Mass.; 190 tons of structural steel to Bethlehem Steel Co.; 545,000 lb. malleable iron castings to the Albany Malleable Iron Co., Voorheesville, N. Y.; 16,000 track bolts to the Lorain Steel Co., Johnstown, Pa. The Worcester Consolidated Railways Co. announces it will place orders for 50 cars in January, and it is intimated by the New York, New Haven & Hartford Railroad that it will soon place 50 cars with the Wason Mfg. Co., Springfield, Mass., for the Springfield Street Railway Co.

Old Material.—Sales are even fewer than they were a week ago, an embargo on shipments to Steelton, Pa., being a contributing factor. Heavy melting steel continues to lead in activity, with most sales at $11 a ton on cars, or at 25c. to 50c. less. Demand for machine shop turnings, forged scrap and flashings has flattened out to almost nothing, and the market for these materials is off about 50c. a ton. Chemical borings are bringing somewhat better prices owing to the fact that brokers are receiving a few shipping instructions. The local trade expects leading New England consumers of material to be in the market shortly after Jan. 1. New England foundries continue to supply most of their machinery cast requirements from nearby yards. Boston prices for this material hold up well owing to the limited supply. The market for railroad malleable is off about 50c. a ton.

The following prices are for gross-ton lots, delivered at consuming points:

Textile cast	$18.00 to $19.00
No. 1 machinery cast	18.00 to 18.50
No. 2 machinery cast	16.50 to 17.00
Stove plate	13.00 to 13.25
Railroad malleable	18.50 to 19.00

The following prices are offered per gross-ton lots, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$10.50 to $11.00
No. 1 railroad wrought	12.00 to 12.25
No. 1 yard wrought	11.00 to 11.25
Wrought pipe (1 in. in diameter, over 2 ft. long)	9.00 to 9.50
Machine shop turnings	7.50 to 8.00
Cast iron borings, chemical	10.50 to 11.00
Cast iron borings, rolling mill	8.00 to 8.50
Blast furnace borings and turnings	8.00 to 8.50
Forged scrap	8.00 to 8.50
Bundled skeleton, long	8.00 to 8.50
Forged flashings	8.00 to 8.50
Shafting	15.50 to 16.00
Street car axles	16.00 to 16.50
Rails for rerolling	12.00 to 12.50
Scrap rails	10.50 to 11.00

Cast Iron Pipe.—Boston will open bids Dec. 30 on 3000 tons of 6 to 16-in. pipe and on Dec. 31 on 200 tons of fittings. Of the 5000 tons of pipe reported sold last week to the Boston Consolidated Gas Co. 4000 tons was placed with the Warren Foundry & Pipe Co. and 1000 tons with R. D. Wood & Co. Prices quoted openly on domestic pipe are: 4-in., $59.10 a ton, delivered common Boston freight rate points; 6 to 12-in., $54.10 to $55.10; larger pipe, $53.10 to $54.10. A $5 differential is asked on Class A and gas pipe.

Coke.—Both New England producers of by-product foundry coke report no improvement in the movement of fuel from ovens. Their prices remain at $13.50 a ton, delivered, within a $3.10 freight rate zone. Local handlers of Connellsville district foundry fuel note no increased demand, although that coke is selling at a discount of $1 or more a ton, delivered, under the New England product. All makers of domestic coke are enjoying a big business, and in some instances are behind on deliveries.

Warehouse Prices, f.o.b. Boston

	Base per Lb.
Soft steel bars and small shapes	3.265c.
Flats, hot-rolled	4.15c.
Reinforcing bars	3.265c. to 3.54c.
Iron bars—	
Refined	3.265c.
Best refined	4.60c.
Norway, rounds	6.60c.
Norway, squares and flats	7.10c.
Structural shapes—	
Angles and beams	3.365c.
Tees	3.365c.
Zees	3.465c.
Plates	3.365c.
Spring steel—	
Open-hearth	5.00c. to 10.00c.
Crucible	12.00c.
Tire steel	4.50c. to 4.75c.
Bands	4.015c. to 5.00c.
Hoop steel	5.50c. to 6.00c.
Cold rolled steel—	
Rounds and hexagons	4.05c.
Squares and flats	4.55c.
Toe calk steel	6.00c.

Buffalo

Increase in Steel Output Looked for—Scrap Market Has Better Tone

BUFFALO, Dec. 27.—Demand for pig iron is very light, and the only inquiry of size is one from the General Electric Co., Schenectady, N. Y., for 1500 tons of foundry and malleable. Many foundries are closing for the holiday season, some to open after Christmas vacation, others to remain closed until after Jan. 1. Makers here have booked an aggregate of 1000 to 1200 tons during the week, it is estimated. Shipping orders are in good volume, and occasionally a request is received to ship first quarter iron this month. Prices are firm at $19 and $20, base Buffalo.

We quote prices per gross ton, f.o.b. Buffalo, as follows:

No. 2 plain fdy., sil. 1.75 to 2.25	$19.00 to $20.00
No. 2X foundry, sil. 2.25 to 2.75	19.50 to 20.50
No. 1X foundry, sil. 2.75 to 3.25	20.50 to 21.50
Malleable, sil. up to 2.25	20.00
Basic	19.00
Lake Superior charcoal	27.28

Old Material.—A strengthening factor in the scrap market is that assurance has been given dealers by two of the local mills holding up shipments that releases on all orders now suspended will be made immediately after the holidays. Each of the mills expects to increase open-hearth operations early in January. There have been some sales of borings and turnings at $13 to $13.50 and of shoveling turnings at $13 to $13.50. A small tonnage of low phosphorus has been purchased for $17.50.

We quote prices per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	$15.00 to $15.50
Selected No. 1 heavy melting steel	16.50 to 17.00
Low phosphorus	18.00 to 19.00
No. 1 railroad wrought	14.00 to 14.50
Carwheels	16.00 to 16.50
Machine shop turnings	9.00 to 9.50
Mixed borings and turnings	12.00 to 12.50
Cast iron borings	12.00 to 12.50
No. 1 busheling	15.00 to 15.50
Stove plate	14.50 to 14.75
Grate bars	12.00 to 13.00
Hand bundled sheets	10.50 to 11.50
Hydraulic compressed sheets	15.00 to 15.50
No. 1 machinery cast	16.00 to 16.25
Railroad malleable	16.50 to 17.00
Iron axles	24.00 to 25.00
Steel axles	16.00 to 16.50
Drop forge flashings	13.00 to 13.50

Finished Iron and Steel.—Some improvement in business is noted this week, and sellers agree that bookings in the first two weeks of December were considerably better than in the first two weeks of November. Prices on bars and shapes are steady, and specifying is fair. Sheets appear somewhat stronger, with 3c., base Pittsburgh, being done on No. 24 gage

Warehouse Prices, f.o.b. Buffalo

	Base per Lb.
Plates and structural shapes	3.40c.
Mild steel bars	3.30c.
Cold-finished shapes	4.45c.
Rounds	3.95c.
No. 24 black sheets	4.30c.
No. 10 blue annealed sheets	3.80c.
No. 24 galvanized sheets	5.15c.
Common wire nails, base per keg	$3.90
Black wire, base per 100 lb	3.90

black and 3.85c. on galvanized. Automobile body sheets are showing some activity. Sellers report a strong demand for lapweld pipe from the oil country. Canadian business has improved considerably. One hundred tons of reinforcing bars for new bins for the Dolomite Co., Rochester, N. Y., has been taken by a local maker, who will also supply 75 tons for a Buffalo school. A western New York ice cream factory is being figured, and it is expected it will call for a substantial tonnage of reinforcing bars.

Cincinnati

Sale of 18,000 Tons of Foundry Pig Iron—Lower Coke Expected

CINCINNATI, Dec. 27.—The purchase of 18,000 tons of foundry pig iron by the Standard Sanitary Mfg. Co. for its Louisville plant has been the outstanding feature in the local market during the past week. It is understood that 12,000 tons was divided equally between two furnaces in the Ironton district and that the remainder will be supplied by a producer outside of the southern Ohio territory. While the price developed by this transaction has not been made public, it is reported to have been less than $20, base Ironton, plus the rail rate to Louisville. A few carload lots of Northern foundry iron have been booked by an Ironton seller at $20, base furnace. In the silvery market, quotations are being maintained at $28.50, base Jackson, for 8 per cent, although an advance of $1 a ton is scheduled to go into effect Jan. 1. Southern iron is available at $20, base Birmingham, but little tonnage has been sold north of the Ohio River. Incidentally, it is of interest to note that for the second consecutive time the Standard Sanitary Mfg. Co. purchased Northern iron exclusively, because the delivered price quoted by Alabama producers was out of line. The Lunkenheimer Co., Cincinnati, is inquiring for 650 tons of foundry iron for first quarter delivery. However, no other inquiries of consequence are before the trade.

Based on freight rates of $3.69 from Birmingham and $1.89 from Ironton, we quote f.o.b. Cincinnati:

Alabama fdy., sil. 1.75 to 2.25 (base)	$23.69
Alabama fdy., sil. 2.25 to 2.75	24.19
Tennessee fdy., sil. 1.75 to 2.25	23.69
Southern Ohio silvery, 8 per cent	30.39
So. Ohio fdy., sil. 1.75 to 2.25	21.89
So. Ohio malleable	21.39

Finished Material.—Bookings in the past week were moderate in volume, but orders were confined almost without exception to small tonnages for prompt delivery. Many consuming industries have decreased production schedules until after the first of the year and, consequently, are postponing purchases of material. Producers, however, are optimistic about the outlook for the first quarter, the majority predicting that specifications and orders in good volume will be realized.

Warehouse Prices, f.o.b. Cincinnati

	Base per Lb.
Plates and structural shapes	3.40c.
Bars, mild steel or iron	3.30c.
Reinforcing bars	3.30c.
Hoops	4.00c. to 4.25c.
Bands	3.95c.
Cold-finished rounds and hexagons	3.85c.
Squares	4.35c.
Open-hearth spring steel	4.75c. to 5.00c.
No. 24 black sheets	4.05c.
No. 10 blue annealed sheets	3.60c.
No. 24 galvanized sheets	4.90c.
Structural rivets	3.75c.
Small rivets	65 per cent off list
No. 9 annealed wire, per 100 lb	$3.00
Common wire nails, base per keg	2.95
Cement coated nails, base per 100-lb. keg	3.15
Chain, per 100 lb	7.55
	Net per 100 Ft.
Lap welded steel boiler tubes, 2 in.	$18.00
4-in.	38.00
Seamless steel boiler tubes, 2-in.	19.00
4-in.	39.00

Despite the sluggishness of the market, prices of most products are holding firm. The only weakness in the entire list is to be found in sheets. Sheet mills, in some cases, have made a determined effort to obtain business by quoting as low as 2.85c., base Pittsburgh, on black sheets and 3.75c., base Pittsburgh, on galvanized sheets. Blue annealed sheets have been sold at 2.30c., base Pittsburgh, and automobile body sheets are in better demand at 4.25c., base Pittsburgh. Fabricators are fairly well engaged on numerous small jobs, but the number of new projects announced has slumped severely in the past two weeks. Bars and structural shapes are selling at 2c., base Pittsburgh, while tank plates are steady at 1.90c., base Pittsburgh. In the wire market little interest is being shown either by consumers or by the jobbing trade. Both are well supplied for current needs, and the light call for material is reflected in the curtailment of production by mills in this territory. Specifications and orders for cold-rolled products have been encouraging, and the stepping up of operations by companies allied with the automotive industry is expected to bring out an increased demand. The Big Four railroad will take bids until Jan. 4 on steel locomotive and car axles, steel tubes and safe ends, common wire nails, woven wire fence and galvanized barbed wire covering its first quarter requirements.

Reinforcing Bars.—Dullness pervades the local market, and few important awards are anticipated in the next few weeks. Meanwhile new billet bars are quoted nominally at 2c., base Pittsburgh, and rail steel bars at 1.90c., base mill.

Warehouse Business.—The proximity of the holidays has been felt in the past week, and sales were the smallest in several months. Bookings in December, however, will compare favorably with those in the same period last year. Prices remain unchanged.

Coke.—Announcement has been made that the prices of by-product foundry and domestic coke will remain unchanged during January. Specifications in the past month have been considerably less than those in November, domestic grades particularly having suffered because of the mild weather. There has been a further reduction of 50c. a ton on foundry coke from the New River district, the present schedule calling for $7.50 per net ton, f.o.b. ovens. A downward revision of wages both in the Wise County and New River producing fields is expected Jan. 1. If such a reduction takes place, the consumer is likely to benefit by having the decrease passed along in the form of lower prices.

Based on freight rates of $2.14 from Ashland, Ky., and $2.59 from Wise County ovens and New River ovens, we quote f.o.b. Cincinnati: Wise County foundry, $8.09 to $9.59; New River foundry, $10.09 to $10.59; by-product foundry, $10.14.

Old Material.—The market is sluggish. Some mills are taking small quantities of material on contract, but others have requested suspension of shipments until next month. Foundry grades are in light demand because of reduced foundry operations in this territory. Dealers are of the opinion that there will be little buying before the middle of January. Meanwhile prices remain unchanged but are considered merely nominal.

We quote dealers' buying prices, f.o.b. cars, Cincinnati:

Per Gross Ton	
Heavy melting steel	$12.50 to $13.00
Scrap rails for melting	12.50 to 13.00
Short rails	17.50 to 18.00
Relaying rails	26.50 to 27.00
Rails for rolling	14.00 to 14.50
Old carwheels	12.00 to 12.50
No. 1 locomotive tires	16.50 to 17.00
Railroad malleable	14.50 to 15.00
Agricultural malleable	13.50 to 14.00
Loose sheet clippings	7.00 to 7.50
Champion bundled sheets	8.50 to 9.00
Per Net Ton	
Cast iron borings	7.50 to 8.00
Machine shop turnings	7.00 to 7.50
No. 1 machinery cast	17.00 to 18.00
No. 1 railroad cast	14.00 to 14.50
Iron axles	19.50 to 20.00
No. 1 railroad wrought	9.00 to 9.50
Pipes and flues	7.50 to 8.00
No. 1 busheling	9.00 to 9.50
Mixed busheling	5.50 to 6.00
Burnt cast	6.50 to 7.00
Stove plate	9.00 to 9.50
Brake shoes	9.50 to 10.00

SCRAPPING OLD AUTOMOBILES

Estimated That 1,000,000 Cars A Year Reach Scrap Yard—Iron, Steel and Non-Ferrous Metals Recovered

The graveyards of old automobiles are small and not at all pretentious, but they are scattered and numerous and in the elimination of a used car from active service are quite efficient. As the production rate of the automobile industry in the United States has risen, year by year, more and more worn and disabled cars have found their way to the yards of the automobile wreckers, until today it is estimated by the makers that close to a million cars a year find their way to the scrap yard.

Tucked away on small corners and in back-yards are the "works" of the dealers who buy up the cars ready for the scrap heap. Many come into the yard on their last trip under their own power; others are towed.

Of course, during the period of the war, values were high, but principally as a result of the high market prices prevailing. Then it was that a wrecker would purchase an old car of the higher-priced makes for $50 and sell the scrap and second-hand parts worth salvaging for as much as $200. Today $35 to $45 will be paid and the gross return to the wrecker is in the neighborhood of $80 to $90. Quantity destruction, however, to the extent of two to three cars a day in the average small yard, with only one or two workmen to pay, shows a fair return of profit.

The wrecker of used cars has various products from which to derive a profit, their quantity and quality depending upon the make of the car and the year in which it was manufactured. In general, a wrecked car will produce iron and steel, aluminum, brass, rubber, copper, hair and some babbitt metal. An estimated average lot of iron and steel from a high-grade car will range from 1400 to 2300 lb. With the exception of an occasional old car made in the early days of the industry, from 1905 to 1908 or 1909, a Packard probably produces as much scrap of value as any of the cars in its class. The one car, according to wreckers that has improved in scrap value since 1915 is the Cadillac, which has since then included an aluminum crank case and base, giving to the scrap pile close to 275 lb. of aluminum. An average Packard, of no specific date of manufacture, will provide from the motor about 200 lb. of aluminum and added to that is the body, hood and fenders, with another 50 to 75 lb. and the radiator with about 50 lb. of aluminum sheets. Trimmings, the windshield frame, door handles, the steering post and other small items will produce close to 75 lb. of brass. In steel, the four leaf-springs will amount to about 90 lb. of spring steel, the axles, front and rear, close to 100 lb. and the steel chassis about 400 lb.

Various makes of car vary considerably in the quantities of certain kinds of metal they provide. An old Locomobile is a profitable "buy" for the wrecker, giving up for the scrap heap about 125 lb. of brass and 250 to 300 lb. of aluminum, but, as a result of the large quantity of non-ferrous metals, providing only a moderate amount of iron and steel. When a Franklin comes into the yard the chassis must be discounted in figuring the scrap value, for it is of wood, and as it is air-cooled the radiator cannot contribute its usual quota of metal. The Franklin, however, is of certain value for the used parts that may be salvaged for resale. An Oakland is light in scrap value and at best will provide about 75 lb. of cast iron from the engine block, and when equipped with an aluminum body 50 to 75 lb. of aluminum.

Fords provide but little of value, that is the Ford made in 1915 or since that date. Yards equipped to cut them up with the electric arc will find some profit if the price is low enough, but it is claimed there is little of value to be obtained, as the parts are too cheap to make their salvage at all profitable. The Ford turned out since 1915 will give up about 100 lb. of machinery cast iron from the engine block and 50 to 60 lb. of steel from the chassis. The pre-1915 product of the Ford Motor Co. is a more profitable investment for the wrecker, for in the older car the transmission case is of aluminum, weighing about 30 lb., brass trimmings and fittings contribute from 35 to 40 lb. of this metal, the engine block is only 10 lb. lighter than the present one of 100 lb. and the chassis is heavier, weighing up to 75 lb.

WAVES OF IMMIGRATION

Studies of the National Bureau of Economic Research

NEW YORK, Dec. 27.—The picture of immigration into the United States during the last hundred years is one of successive waves, the crest of the major waves occurring respectively in 1854, 1873, 1882, 1892, 1907, 1914, 1921, according to a statement issued today by the National Bureau of Economic Research, Inc., 474 West Twenty-fourth Street, New York, summarizing the figures assembled in a report entitled "Migration and Business Cycles" which gives the results of an investigation of the ebb and flow of labor in relation to the varying demands of industry.

Immigration to the United States has been preponderantly male in every year from 1820 to 1923, except the fiscal year of 1922, when the ratio of males fell to 48 4/10 per cent of the total immigration. In most of the years since the Civil War males have constituted from 60 to 70 per cent of the total immigration. Incidentally the percentage of male immigration is relatively high in prosperous years, such as the fiscal years of 1907 and 1910, and relatively low in the succeeding depression periods.

Males Leave During Depression

In emigration, males constitute even a larger proportion than in immigration. This proportion was highest in the depression year 1908, when of 395,073 total emigrants, 342,883, or 86 8/10 per cent of the whole outgoing movement, were males. The 1908 figures do not include departing citizens or non-emigrant aliens. Since the collection of emigration statistics began in 1908, males have constituted at least 70 per cent of the total in every year but 1923. The restriction of immigration has tended to decrease the proportion of males in emigration as well as in immigration.

Between 40 and 50 per cent of the foreign-born workers enter mechanical and manufacturing pursuits while less than 15 per cent are found in the agricultural pursuits. Of all the persons employed in agriculture, for example, in 1910, only 8.7 per cent were foreign born, whereas 48 per cent of those in mining and 31.9 per cent of those in manufacturing and mechanical pursuits have a foreign nativity. Of those classified as laborers in 1910, however, the foreign born represent 50.1 per cent of all those in mining, 38.5 per cent in manufacturing and mechanical pursuits, and 27.4 per cent of all classified as laborers.

Volume Increases During Quota Period

The barriers created by war conditions checked immigration to such an extent that it dropped to a small fraction of its former volume, reaching low ebb in the year ending June, 1918, with two alien arrivals to each 1000 population. By 1920, the incoming flow was gaining momentum and in the fiscal year of 1921 reached almost a pre-war level at 0.9 per cent. The depression of 1921 brought a marked reduction in the ratio during the fiscal year 1922, but in the two subsequent years, despite the restrictions of the 3 per cent quota law, the annual volume increased to over one-half of 1 per cent of the population.

RAILROAD EQUIPMENT

Orders for 118 Freight Cars and 14 Locomotives—No New Inquiry for Rolling Stock

Only 118 freight cars, a few passenger cars and 14 locomotives were ordered by railroads during the past week. No new inquiry of importance has come into the market. Details of the week's business follow:

The New York Central has purchased 10 air dump cars from the Clark Car Co.

The Conley Tank Car Co. has purchased 100 tank cars from the American Car & Foundry Co. in addition to those placed a few weeks ago.

The Carnegie Steel Co. has bought eight 75-ton hopper ore cars from the American Car & Foundry Co.

The Norfolk & Western has placed three dining cars with the Pullman Car & Mfg. Corporation.

The Denver & Rio Grande Western has purchased four dining cars from the American Car & Foundry Co.

The Mobile & Ohio is inquiring for six steel baggage cars, four passenger coaches, two steel partition coaches and one steel baggage-mail car.

The New York, New Haven & Hartford has ordered 10 Mountain type locomotives from the American Locomotive Co.

The New York, Chicago & St. Louis has ordered four 4-6-4 type locomotives from the American Locomotive Co.

The Burlington is in the market for five or six passenger car underframes.

The Chicago & North Western is inquiring for two gun cars.

REINFORCING STEEL

Awards of 2900 Tons Including 1400 For an Office Building in Cincinnati

An office building to be erected in Cincinnati, which will take 1400 tons of reinforcing bars, is the largest award of the week. The total, including this job, comes to 2900 tons. About 1500 tons of small jobs have come into the market for bids. Awards follow:

PATERSON, N. J., 270 tons, building for New York Telephone Co., to Igoe Brothers.

HOBOKEN, N. J., 120 tons, Y. M. C. A. building, to McClintic-Marshall Co.

WILLOW SPRINGS, ILL., 100 tons of rail steel for road work, to Olney J. Dean & Co.

CHICAGO, 100 tons of rail steel, apartment building at 2051 West Washington Boulevard, to Inland Steel Co.

SACRAMENTO, CAL., 100 tons, warehouse for Libby, McNeill & Libby, to an unnamed San Francisco jobber.

SAN FRANCISCO, 500 tons, warehouse for the Zellerbach Paper Co., to an unnamed San Francisco jobber.

PHILADELPHIA, 100 tons, factory building for Laurel Soap Co., to A. Taylor Co.

CINCINNATI, 1400 tons, Union Central Life Insurance Building, 1200 tons to Bourne Fuller Co. and 200 tons to Pollak Steel Co.

CHICAGO, 110 tons of rail steel, apartment building at Roscoe and Paulina Streets, to Olney J. Dean & Co.

CHICAGO, 100 tons of rail steel, apartment building, 5417 Kenmore Avenue, to Calumet Steel Co.

Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

NEW YORK, 100 tons, warehouse for Dunham & Reed, Inc.; general contract not let.

NEWARK, 100 tons, addition to City Hall; Frank Briscoe Co., general contractor.

RIVERSIDE, OHIO, tonnage being estimated, round house for the Big Four Railroad.

CHICAGO, 100 tons, Dunn warehouse; F. Stanton, architect.

CHICAGO, 175 tons, municipal tuberculosis sanitarium.

CHICAGO, 500 tons, office building at Wells and Van Buren Streets; David Sol Klafter, architect.

CHICAGO, 100 tons, garage at Fifty-ninth Street and Stoney Island Avenue; P. F. Olsen, architect.

CHICAGO, 100 tons, Farwell Building; general contractor, R. C. Wieboldt Construction Co.

OAKLAND, CAL., 100 tons, crematory.

SAN MATEO, CAL., 100 tons, crematory.

SACRAMENTO, CAL., 100 tons, warehouse for Blake-Moffett & Towne.

FABRICATED STRUCTURAL STEEL

Awards and Inquiries Unusually Light, Contracts Totaling Only 11,000 Tons

Christmas week brought an unusually small number of awards of structural steel, the total for the week as reported to THE IRON AGE being only 11,000 tons. Inquiries are also light, the aggregate being slightly under 8000 tons. The largest award was 3100 tons for a highway bridge in Idaho. An inquiry has been sent out for 2500 tons for an amusement pier at Asbury Park, N. J., this being the largest new project up for bids. Awards follow:

BOSTON, 190 tons, Boston Transit Commission, to Bethlehem Steel Co.

NEW YORK, 700 tons, Cortlandt Street garage, to an unnamed local fabricator.

JERSEY CITY, 1260 tons, viaduct for State of New Jersey, to an unnamed fabricator.

SALEM, N. J., 750 tons, highway bridge, State of New Jersey, to Phoenix Bridge Co.

ERIE RAILROAD, 1100 tons, bridges, to American Bridge Co.

PHILADELPHIA, 375 tons, new building, Philadelphia Hospital, to unnamed local fabricator.

PHILADELPHIA, 375 tons, subway station, Philadelphia Rapid Transit Co., to McClintic-Marshall Co.

PHILADELPHIA, 250 tons, House of Correction, to unnamed local fabricator.

BENWOOD, W. Va., 100 tons, Sharpless Furnace Co. plant, to Pittsburgh-Des Moines Steel Co.

BATTLE CREEK, MICH., 1100 tons, 1,500,000-cu. ft. gas holder for Battle Creek Gas Co., to Stacy Mfg. Co.

IRON RIVER, MICH., 130 tons, head frames for M. A. Hanna Co., to Worden-Allen Co.

STATE OF MINNESOTA, 130 tons, State bridges, to American Bridge Co.

SAN FRANCISCO, 200 tons, office building for Pacific Telephone & Telegraph Co., to California Steel Co., San Francisco.

LONGVIEW, WASH., 1000 tons, pulp mill for the Longview Fibre Co., to an unnamed bidder.

TWIN FALLS, IDAHO, 3100 tons, highway bridge, to Wallace Bridge & Structural Steel Co., Seattle.

OAKLAND, CAL., 250 tons, pipe line for the East Bay Water Co., to Western Pipe & Steel Co., San Francisco; about 650 tons is still pending.

TORRANCE, CAL., tonnage not stated, crane runway and building for the International Derrick & Equipment Co., to McClintic-Marshall Co.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

BOSTON, 400 tons, Broadway bridge.

BOSTON, 390 tons, Roxbury High School.

BOSTON, 150 tons, West Newton Street bridge.

HARTFORD, CONN., 350 tons, office building.

NEW YORK, 200 tons, Morgan Library, Thirty-sixth Street and Madison Avenue.

JERSEY CITY, 150 tons, building for Standard Oil Co. of New Jersey.

ASBURY PARK, N. J., 2500 tons, amusement pier.

KEARNY, N. J., 600 tons, two buildings for Western Electric Co.

SCRANTON, PA., 150 tons, building for Public Service Coal Co.

WHITING, IND., 1500 tons, still building for the Standard Oil Co. of Indiana.

REDWOOD CITY, CAL., 250 tons, building for the Pacific Portland Cement Co.

SAN FRANCISCO, 400 tons, plates for the Standard Oil Co. of California.

SAN FRANCISCO, 450 tons, apartment building on Eddy Street.

KALULUI, T. H., 125 tons, frame work for Pier 2 for the Board of Harbor Commissioners; E. J. Loyd, Honolulu, general contractor.

NON-FERROUS METAL MARKETS

The Week's Prices

Cents per Pound for Early Delivery

	Dec. 27	Dec. 24	Dec. 23	Dec. 22
Lake copper, New York	13.62½	13.62½	13.62½	13.62½
Electrolytic copper, N. Y.*	13.25	13.25	13.25	13.25
Straits tin, spot, New York	67.00	66.75	67.12½	67.50
Lead, New York	7.80	7.80	7.80	7.80
Lead, St. Louis	7.65	7.65	7.65	7.65
Zinc, New York	7.37½	7.37½	7.37½	7.37½
Zinc, St. Louis	7.02½	7.02½	7.02½	7.02½

*Refinery quotation; delivered price ¼c higher.

NEW YORK, Dec. 27.—All the markets are quiet and featureless, due largely to the holidays. Demand for copper is exceedingly light at lower prices and even tin has declined considerably. The lead market is quite firm and there has been little change in zinc, either in prices or demand.

Copper.—There has been no improvement in demand and prices have eased off slightly. There are enough sellers for the small business offered to take care of the demand at concessions, and the market has settled to 13.50c., delivered in the Connecticut Valley. While some of the large producers are attempting to quote higher prices, it would be difficult for them to make sales at anything better than the 13.50c., delivered. The year draws to a close with prices at practically the lowest for the past twelve months and with production at a very high rate. One encouraging feature is the fact that most consumers have not bought beyond February and still have considerable metal to buy for January-February delivery, their stocks being admittedly low. The official price of Copper Exporters, Inc., is still 13.95c., c.i.f. Hamburg. Demand from that quarter is also very quiet. Lake copper is easier at 13.62½c., delivered.

Tin.—Business has been at a minimum the past week, with total sales estimated at not over 375 tons. Very little interest is shown either by consumers or dealers. It is estimated that a fair amount of tin must still be bought by consumers for January-February delivery. In general, the market is a dull and drifting one, devoid of features. The London market was closed today because of a holiday. Spot Straits tin was quoted in this market today at 67c., New York, entirely nominal. Arrivals thus far this month have been 5095 tons, with 6190 tons reported afloat.

Lead.—Quietness also pervades this market, but it is the firmest of the major ones. The leading interest continues to quote 7.80c., New York, as its contract price. Apparently enough metal is available from that producer to take care of business offered in the East. Quotations are a little firmer in the outside market, with some producers asking the equivalent of 7.85c. and higher, New York. The market at St. Louis is 7.65c.

Zinc.—Light sales have been made at a range of 7c. to 7.05c., St. Louis, but the market is not at all active. There is no attempt on the part of producers to force the market, and consumers are covering only their immediate needs, which are small.

Antimony.—Reliable reports are to the effect that production in China is only about 50 per cent of normal, because of low prices at the mines. Demand here is light, but prices are a little firmer, with Chinese metal for spot delivery quoted at 13c. to 13.50c., New York, duty paid, and with futures quoted at 13c.

Nickel.—Wholesale lots of ingot nickel are quoted at 35c. with shot nickel at 36c. and electrolytic nickel at 39c. per lb.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is quoted at 26.50c. to 27c. per lb., delivered.

Metals from New York Warehouse

Delivered Prices per Lb.

Tin, Straits pig	68.50c. to 69.50c.
Tin, bar	70.50c. to 71.50c.
Copper, Lake	14.50c.
Copper, electrolytic	14.25c.
Copper, casting	13.75c.
Zinc, slab	7.75c. to 8.25c.
Lead, American pig	8.40c. to 8.90c.
Lead, bar	10.90c. to 11.90c.
Antimony, Asiatic	14.50c. to 15.50c.
Aluminum, No. 1 ingot for remelting (guaranteed over 99 per cent pure)	29.00c. to 30.00c.
Babbitt metal, commercial grade	30.00c. to 40.00c.
Solder, ½ and ½	44.00c. to 45.00c.

Metals from Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits pig	74.38c.
Tin, bar	76.38c.
Copper, Lake	14.75c.
Copper, electrolytic	14.75c.
Copper, casting	14.25c.
Zinc, slab	8.50c.
Lead, American pig	8.50c.
Antimony, Asiatic	17.50c.
Lead, bar	10.75c.
Babbitt metal, medium grade	21.75c.
Babbitt metal, high grade	78.25c.
Solder, ½ and ½	43.75c.

Rolled Metals from New York or Cleveland Warehouse

Delivered Prices, Base per Lb.

Sheets—	
High brass	18.87½c. to 19.87½c.
Copper, hot rolled	22.50c. to 23.50c.
Copper, cold rolled, 14 oz. and heavier	24.75c. to 25.75c.
Seamless Tubes—	
Brass	23.75c. to 24.75c.
Copper	24.50c. to 25.50c.
Brazed Brass Tubes	26.87½c. to 27.87½c.
Brass Rods	16.62½c. to 17.62½c.

From New York Warehouse

Delivered Prices, Base per Lb.

Zinc sheets (No. 9), casks	12.75c. to 13.00c.
Zinc sheets, open	13.25c. to 13.50c.

Non-Ferrous Metals in Chicago

DEC. 27.—The market for non-ferrous metals is quiet and prices are unchanged except lead which is easier than a week ago. The old metal market is dull.

We quote in carload lots: Lake copper, 13.85c.; tin,

Non-Ferrous Rolled Products

Mill prices on bronze, brass and copper products, lead full sheets and zinc sheets are unchanged.

On Copper and Brass Products, Freight up to 75c. per 100 Lb. Allowed on Shipments of 500 Lb. or Over

Sheets—	
High brass	18.62½c.
Copper, hot rolled	22.25c.
Zinc	11.50c.
Lead (full sheets)	11.75c. to 12.00c.
Seamless Tubes—	
High brass	23.50c.
Copper	24.25c.
Rods—	
High brass	16.37½c.
Naval brass	19.12½c.
Wire—	
Copper	15.62½c.
High brass	19.12½c.
Copper in Rolls	21.12½c.
Brazed Brass Tubing	26.62½c.

Aluminum Products in Ton Lots

The carload freight rate is allowed to destinations east of the Mississippi River and also allowed to St. Louis on shipments to destinations west of that river.

Sheets, 0 to 10 gage, 3 to 30 in. wide	37.50c.
Tubes, base	48.00c.
Machine rods	34.00c.

Rolled Metals, f.o.b. Chicago Warehouse

(Prices Cover Trucking to Customers' Doors in City Limits)

Sheets—	Base per Lb.
High brass	18⅝c.
Copper, hot rolled	22.25c.
Copper, cold rolled, 14 oz. and heavier	24.50c.
Zinc	12.25c.
Lead, wide	11.25c.
Seamless Tubes—	
Brass	23.50c.
Copper	24.25c.
Brazed Brass Tubes	26⅝c.
Brass Rods	16⅝c.

69.50c.; lead, 7.75c.; zinc, 7.15c.; in less than carload lots, antimony, 14.50c. On old metals we quote copper wire, crucible shapes and copper clips, 10.75c.; copper bottoms, 9.50c.; red brass, 9.25c.; yellow brass, 7.50c.; lead pipe, 6.50c.; zinc, 4.75c.; pewter, No. 1, 35c.; tin foil, 43.50c.; block tin, 52c.; aluminum, 16.50c.; all being dealers' prices for less than carload lots.

Chicago Iron and Steel

(*Concluded from page* 1851)

in the Chicago switching district. Contracts are now being offered to users, and there appears to be little or no resistance to these prices, which are the same as those which prevailed during the final period of 1926. Sales for short-time delivery are being made at $10.25, local ovens, or $10.75, delivered in the Chicago switching district. December shipments have fallen off in proportion to the curtailment of foundry production.

Billets.—This commodity is fairly active, and several users have placed orders for a total of 5000 tons of 4-in. and larger rerolling billets, at the ruling base price of $35 per gross ton, Chicago.

Reinforcing Bars.—Bids will be received early in the new year for about 1380 tons of reinforcing bars for Illinois State road work. It is probable that this business will go to makers of hard steel bars. On the whole, December business has not been a disappointment to warehouses. Shipments for the month now closing are on a lower scale than in November, but are virtually equal to those of December, 1925. Inquiry is fairly active, and the outlook for January business is promising. Moderate weather of the past week has allowed contractors to speed up construction, and as a result more pressure for delivery has been brought to bear upon warehouses. Shipments now average close to 60 per cent of shop capacity. The bulk of new transactions is made up of contracts for less than 200 tons each. Warehouse prices for billet steel reinforcing bars lack strength at 2.25c. to 2.60c., Chicago. New contracts and recent inquiries are shown on page 1861.

Expanding Transportation in South Africa with Motor Truck

The South African railroads, instead of extending their lines, have acquired a large fleet of over 50 Thornycroft motor vehicles, which they are using for freight and passenger transport on routes up to 100 miles beyond their present termini. Farther north the Sudan government is now operating a large fleet of trucks, including many of the latest rigid six-wheeled lorries, for the transport of cotton in the lower Sudan. These latter vehicles are capable of traversing open country, so that the modern motor vehicle does not even need to wait for roads to be made for it to run on.

Iron and steel manufacturers consumed 20,281,000 bbl. of fuel oil in 1925, according to an article in *Fuel Oil*. Foundries, car shops and smelting plants came next, with a combined consumption about equaling that for iron and steel. Other manufacturing plants raised the total industrial consumption to 119,277,000 bbl.

Old Metals, Per Pound, New York

The buying prices represent what large dealers are paying for miscellaneous lots from the smaller accumulators, and the selling prices are those charged consumers after the metal has been properly prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, heavy crucible	11.00c.	12.75c.
Copper, heavy and wire	10.75c.	11.75c.
Copper, light and bottoms	9.00c.	10.50c.
Brass, heavy	6.75c.	8.25c.
Brass, light	6.00c.	7.50c.
Heavy machine composition	8.50c.	10.00c.
No. 1 yellow brass turnings	8.25c.	8.75c.
No. 1 red brass or composition turnings	8.00c.	9.00c.
Lead, heavy	6.50c.	7.00c.
Lead, tea	4.75c.	5.50c.
Zinc	4.25c.	4.75c.
Sheet aluminum	15.00c.	17.00c.
Cast aluminum	15.00c.	17.00c.

EXPORT BUSINESS QUIET

Japan Somewhat Active in Rails and Tin Plate —Steel Importers Booking Small Orders

NEW YORK, Dec. 27.—Importers of foreign steel report only moderate activity at present. Continental prices are somewhat easier and Belgian and French material is quoted at 1.80c. to 1.85c. per lb, base, duty paid. Sales of German steel are limited to small tonnages, importers, as a rule, being unwilling to risk receiving dumping charges on more than 25 to 50 tons of material. The investigation of the Government into the question of dumping of German steel in this country is evidently continuing and in a few instances consumers of steel, who purchased tonnages through importers, have received requests from the Government for information as to the price paid and the American mill quotation at time of purchase.

Export business is also limited as the year draws to a close. Tin plate for the Kioto Oil Co. in Japan, 10,260 boxes of which were awarded to one large Japanese house and 7600 boxes to another Japanese export company, has not yet been placed for execution. The 3.2 miles of 100-lb. rails and accessories for Osaka municipality, bids on which were opened Dec. 20, were awarded to a large Japanese importer in Japan and placed with a German mill. Nagoya municipality opened bids Dec. 24, and Tokio municipality on Dec. 25, for small rail tonnages.

The 1000 tons of copper-bearing steel sheets for the Imperial Government Railways have been awarded to one of the largest Japanese export houses and divided between two American makers, the leading interest and the American Rolling Mill Co., furnishing Armco sheets. About 300 tons of electrical steel sheets for the Shibaura Engineering Co. in Japan have been placed by Mitsui & Co. with an American mill.

Steel Cartel Quota Reduced to 28,000,000 Tons for 1927

WASHINGTON, Dec. 24.—The European Steel Cartel on Dec. 9 reduced the production quota for the current year beginning the first quarter of 1927, by 1,500,000 metric tons, making the new output basis 27,787,000 tons, according to advices received by the Department of Commerce from Paris. This reduction was the result of the buyers' strike in the home markets of the member countries and the resumption of operations by the British iron and steel industries, says the report. Negotiations to secure adherence of the Czechoslovakian, Austrian and Hungarian Steel industries resulted in these nations joining the Steel Cartel in principle, on Dec. 11, their production quotas to be based on individual production during the first quarter of 1926. The Polish industry is understood to be awaiting reorganization of its group of steel producers before joining the cartel. It is further reported that the European Rail Makers' Association is again studying the proposals of the German producers, in an effort to reach an agreement with that group governing rail production.

NEW TRADE PUBLICATIONS

Electric Controllers.—General Electric Co., Schenectady, N. Y. Publication GEA-451, describing the MT control system for direct current motors. Sections of the pamphlet are devoted to auxiliary control and crane motor control with various diagrams and charts of use to the engineer in making installations or adaptations.

Refractory Materials.—Quigley Furnace Specialties Co., Inc., 26 Cortlandt Street, New York. Booklet dealing with the use of Hytempite as a bonding for fire brick. Comparisons are made with other types of material used for the same purpose, and various economies pointed out. A second section of the booklet describes the company's refractory gun for use in the building of heat resistive linings.

Reinforcing Lath.—General Fireproofing Co., Youngstown, Ohio. Booklet describing the company's "Self-Sentering," a combined form, lath and reinforcement for concrete walls, floors and roofs, with various details of its uses. The latter part of the booklet is given over to "Trussit," a reinforcement for walls and partitions, with full specifications and data for installation.

Refractory Materials.—Botfield Refractories Co., Philadelphia. Pamphlet containing reprints of letters telling of successful installations of the company's Adamant fire brick cement with numerous descriptive photographs.

Sandcutters.—Production Equipment Co., 5213 Windsor Avenue, Cleveland. Nos. 1, 2, and 3 of a series of bulletins describing the company's cutters for the speedy conditioning of foundry sand. The small type C machine, the medium-sized type E and the large model F especially designed for work in very large foundries are treated in the bulletins under consideration.

Electric Motors.—Century Electric Co., 1806 Pine Street, St. Louis. Folder describing the operation, lubrication and insulation of repulsion-start induction single-phase motors especially designed for use on oil burners, house pumps and mechanical refrigeration systems.

Special Machinery.—Dodge Mfg. Corporation, Mishawaka, Ind. Artistically prepared booklet, printed on a background of views of the company's plant, designed to acquaint the trade with the facilities of Dodge equipment for the manufacture of plate glass machinery, paper mill machinery, rolling mill equipment and other special machinery.

Diesel Engines.—Fulton Iron Works Co., St. Louis. Bulletin devoted to the making and use of the company's 4-cycle, air injection Diesel engines from 300 to 2000 hp. Of particular interest is the section devoted to the amount of cooling water required by the engines with an accompanying temperature rise chart.

Trench Braces.—Templeton, Kenly & Co., Ltd., 1020 South Central Avenue, Chicago. Leaflet devoted to the company's steel trench braces and fittings.

Refractory Materials.—Ashland Firebrick Co., Ashland, Ky. Illustrated circular briefly touching on the essential characteristics of the company's various types of firebrick.

Machine Tools.—Blake & Johnson Co., Waterbury, Conn. Leaflets containing illustrations, descriptions and complete specifications of the following machines manufactured by the company: slitting machines, light high-speed type, either belt or motor drive; belt-driven automatic blockers, Kenworthy type; flattening machines, 4-housing type, and high-speed 2-housing mills, ball bearing throughout.

Voltage Regulators.—American Brown Boveri Electric Corporation, 165 Broadway, New York. Circular 702, describing the company's quick acting generator voltage regulator. Design and operation, adjustment, compounding, applications, accuracy and general appearance of the regulator are given with adequate graphs and illustrations.

Centrifugal Pumps.—Ingersoll-Rand Co., 11 Broadway, New York. Bulletin dealing with the Cameron single stage, double suction volute pumps manufactured by the A. S. Cameron Steam Pump Works. Illustrations and cross sections of the pumps are included as well as a number of photographs of successful installations.

Hoisting Equipment.—Wright Mfg. Co., Lisbon, Ohio. Catalog No. 11, a comprehensive handbook on chain hoists, trolleys, hand cranes and allied equipment. Cuts and descriptive matter are included as well as line drawings giving all dimensions and clearances of the company's products.

Twist Drills.—New Process Twist Drill Co., Taunton, Mass. Pamphlet briefly describing the company's line of high speed and carbon twist drills.

Automatic Temperature Control for Heat Treating.—Bristol Co., Waterbury, Conn. Bulletin 348 of eight pages describes pyrometer controller model 479, used in connection with heat treating steel. Details of the instrument are shown, together with a description of its principal features.

Roller Mills.—Combustion Engineering Corporation, 43 Broad Street, New York. Pamphlet of 20 pages describing Raymond roller mills and pulverizers with air separation. The entire control is pneumatic. Installation applications are shown for coal, limestone, magnesite, manganese ore and oxide and a wide variety of other products.

Pneumatic Collecting and Conveying Systems.—B. F. Sturtevant Co., Hyde Park, Boston, Mass. Catalog 291 of 72 pages is divided into two parts, the first of which in 46 pages describes apparatus used in collecting and conveying materials. The second part is devoted to data covering design and application of collecting systems. In general, the materials collected are dust, smoke, fumes and gases, which are conveyed away from the point of generation. At the same time systems for collecting fibrous materials, as in textile mills, are shown, some of the systems handling wool which is not touched by hand from the time it is fed to the picker until it reaches the cards. Engineering data in the second section include many tables, associated with a number of diagrams.

Industrial Furnaces

Directors of the Columbia Steel Corporation, San Francisco, at a meeting Dec. 20, voted to continue the payment of preferred stock dividends in common stock as in the past. This is in accordance with a provision made at the time the preferred stock was offered several years ago. This provision will end in November, 1927, when cash dividends may be resorted to. The Columbia Steel Corporation preferred stock is a 7 per cent cumulative security, and the common stock has a market value of $6 per share at present. The dividend will be payable in January to stock recorded on the books of the corporation on Dec. 31. It is understood that the corporation has been earning enough to pay cash on its preferred stock but has used its earnings for expanding operations and for the accumulation of surplus capital.

The Mystic Iron Works, Everett, Mass., which is reported to have operated at a loss of approximately $50,000 in October, its first month of activity, showed an operating profit in November.

Net earnings before taxes of the Moore Drop Forging Co., Springfield, Mass., for the year ended Oct. 31, last, were $603,217, which compares with $1,039,455 for the previous year. After setting up $81,000 for tax reserves, and deducting the $6 a share dividend on the class A stock, with the usual sinking fund provisions, earnings were equivalent to $2.75 a share on the company's class B shares, as against $5.71 on the same stock the previous year.

The Pratt & Whitney Co., Hartford, Conn., a subsidiary of Niles-Bement-Pond Co., in addition to the regular dividend of 1½ per cent on the preferred stock payable Feb. 20, next, is to pay 3 per cent additional on Dec. 31. Payments on the preferred shares were omitted in 1924. After deferred disbursements had accrued 10½ per cent, dividends were resumed. With the payment of the 3 per cent just declared, all back dividends will have been paid.

H. T. Brewster, superintendent water department, Denton, Tex., has been authorized to purchase a new 300 to 400-hp. engine-generator set for the municipal waterworks. Specifications will be arranged early in January.

The Buick Motor Co., Broadway and Third Streets, San Antonio, Tex., is completing plans for a proposed three-story and basement service, repair and garage building, 80 x 145 ft., to cost approximately $115,000 with equipment. H. E. Mills, San Antonio, is engineer.

A new catalog has been issued by William Swindell & Brothers, Pittsburgh, describing various types of melting and heat-treating electric furnaces which that company manufactures. It is profusely illustrated with photographs of some of the installations which the company has made of both types of furnaces in various parts of the United States. In the first part, 27 pages are devoted to a description of the electric melting furnaces, and the other 12 pages contain descriptions of electric heat-treating units.

PERSONAL

A. P. James, formerly sales manager, automotive replacement department, Bunting Brass & Bronze Co., Toledo, Ohio, has been placed in charge of the company's Pacific Coast division with headquarters at 198 Second Street, San Francisco. Mr. James was promoted to executive and sales positions in the Bunting company from its factory departments, and has familiarized himself with all the steps in production from raw materials to sales.

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H. C. Mode, for more than 20 years connected with the Westinghouse Electric & Mfg. Co., at East Pittsburgh and Philadelphia, has recently joined the staff of the railroad division of the American Brown Boveri Electric Corporation, Camden, N. J.

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C. A. Graham has been appointed national distributer in complete charge of sales for the Plimpton Lift Truck Corporation, Stamford, Conn. His headquarters are at 170 Broadway, New York.

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S. M. Buck, vice-president Taylor-Wharton Iron & Steel Co., High Bridge, N. J., has been placed in charge of the newly created service department of the company and will have as his duties the coordinating of delivery service between its several plants, the outside offices and the customers. He also has supervision of purchasing, traffic and employee relations for all the Taylor-Wharton plants.

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James A. Henry, formerly Detroit district manager Wheeling Steel Corporation, has resigned that position to become Detroit district manager of sales for the Columbia Steel Co., Pittsburgh. H. U. Van Leyen, who has been in charge of the Detroit office of the latter company, will remain with Mr. Henry.

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William P. Ewing, sales representative Superior Steel Corporation, Pittsburgh, has been promoted to the position of assistant general manager of sales. He has been associated with this corporation for ten years and before entering the sales department had served in the operating division. Walter G. Blume will assume some of Mr. Ewing's former duties. The New York metropolitan district sales of the corporation hereafter will be handled from the Philadelphia office in charge of John E. Wetzel, with Reed L. Smith as assistant district sales manager, with headquarters in New York. Bruce-Mueller-Hautley, Inc., with offices in Buffalo and Syracuse, hereafter will be sales representative for the corporation in New York outside of the metropolitan district and in northeastern Pennsylvania. F. P. Norris, formerly associated with the Stanley Works, Hartford, Conn., has been added to the Hartford sales force of the Superior company under the direction of George W. Sweeton, district manager of sales.

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Ambrose Swasey, chairman of the board of the Warner & Swasey Co., Cleveland, celebrated his eightieth birthday Dec. 18. Worcester R. Warner, vice-chairman of the Warner & Swasey board and for years Mr. Swasey's business associate, was 80 years old last May.

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S. L. Dryfoos, for 16 years general manager of the Taylor & Boggis Foundry Division, Consolidated Iron-Steel Mfg. Co., Cleveland, has been made vice-president of the Foundry Equipment Co., Cleveland. He is a graduate of the Case School of Applied Science and, previous to his association with the Taylor & Boggis organization, was engaged in blast furnace work and served for some time in the sales department of an Eastern steel company.

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W. H. Brandt, advertising manager Chain Belt Co., Milwaukee, has been appointed assistant secretary, succeeding George M. Dyke, who has gone to Cleveland as secretary of the Stearns Conveyor Co., now owned by Chain Belt Co.

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W. M. Vastable, formerly sales manager Wilson Welder & Metals Co., Hoboken, N. J., has become New York district manager for the Electric Welder Controller Co., Pittsburgh, with offices at 26 Cortlandt Street, New York.

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E. J. Lavino has become chairman of the board of directors of E. J. Lavino & Co., Bullitt Building, Philadelphia, manufacturers and dealers in ferromanganese and other ferroalloys, ores, refractories, etc., and has been succeeded as president of the company by Edwin M. Lavino, who was vice-president. All of the other officers remain the same.

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S. W. Wakeman, whose appointment as vice-president and general manager of the Bethlehem Shipbuilding Corporation, Ltd., was announced recently, has been made a member of the administrative council of the Atlantic Coast Shipbuilders' Association. As the representative of the New England section on the association's governing body, he will direct the work of further enlisting the support of marine interests in the New England States in the activities of the body.

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Hon. Herbert Hoover, Secretary of Commerce, delivered what is known as the Sigma Xi lecture on Dec. 28 at Philadelphia before the annual meeting of the American Association for the Advancement of Science and associated societies. Sigma Xi is the name of the honorary fraternity devoted to scientific research and to which elections are commonly made from science departments of colleges.

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George E. Dix, 17 Dey Street, New York, who represents a German steel company in the sale of sheet steel piling in the United States, sailed Dec. 26 on the steamship Deutschland for Germany and France and will be gone for about 30 days.

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W. J. Stoop, general engineer Wheeling Steel Corporation, Wheeling, W. Va., has been made general manager of the Morgan Engineering Co., Alliance, Ohio, under the terms of the creditors' extension agreement which went into effect on Dec. 21. W. S. Maddox is chairman of the creditors' committee.

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E. E. Goodwillie has been appointed assistant general sales agent of the Bethlehem Steel Corporation, with headquarters at Bethlehem, Pa. He succeeds to a position which was not filled when R. W. Gillispie, then assistant general sales agent, was transferred to the structural and plate sales department. Mr. Gillispie later resigned to become vice-president of the Jeffrey Mfg. Co., Columbus, Ohio. Mr. Goodwillie has been for the past year and a half Pacific Coast sales agent for the Bethlehem Steel Corporation, prior to which time he occupied the same position in Chicago. He will take up his new duties at Bethlehem on Jan. 3. Arnold E. Foster succeeds Mr. Goodwillie as Pacific Coast sales agent. He has been assistant treasurer of the Bethlehem Steel Corporation at San Francisco.

"The Hydraulic Press" is the name of a new house publication to be issued quarterly by the Hydraulic Press Mfg. Co., Columbus, Ohio. The first issue is semi-technical in nature, and contains several articles of general interest to manufacturers in the industrial field. Beginning with the next issue a special series of articles dealing with the hydraulic transmission of power will be published.

A number of questions of importance to the electric arc-welding industry are answered in the first issue of "The Operator's Stabilizer," the new house publication of the Lincoln Electric Co., Cleveland, and edited by A. F. Davis, vice-president of the company. The bulk of the reading matter consists of letters received by the company from the trade with answers and comments by the editor.

OBITUARY

HARRY P. OTIS, formerly president of the Norwood Engineering Co., Florence, Mass., near Northampton, died at his home in that town Dec. 26, aged 73 years. He was a native of Manchester, Conn., and graduated in 1878 from the engineering department of Massachusetts Agricultural College. His father, Gen. John Lloyd Otis, was treasurer and general manager of the Northampton Emery Wheel Co., and the son held these offices as his successor for a number of years.

FRANK M. BOOKWALTER, for many years vice-president and treasurer of James Leffel & Co., Springfield, Ohio, maker of turbine water wheels and steam boilers, died Dec. 23 at his winter home in Miami, Fla., aged 79 years. He became associated with the Leffel company in 1870, and retired but a short time ago.

Products of Low-Temperature Carbonization of Coal

The quantity and quality of the carbonization products of coal depend on the type of coal used and the heat treatment the coal receives in the process, states the Bureau of Mines, Department of Commerce. High-temperature processes yield hard cellular coke and crack the primary tars into fixed gases, aromatic light oils and viscous tars containing phenols, cresols, anthracene, naphthalene and other aromatic compounds. Low-temperature processes yield softer semi-coke, which retains 7 to 15 per cent of volatile matter, and also yield uncracked and but slightly decomposed primary tars and oils containing paraffins, naphthalenes, cresols, xylenols, and higher phenols. The volume of the gas is only one-fourth to one-third that obtained in high-temperature coking, but the calorific value per cubic foot is almost twice as high. From both processes the quantity of light oil suitable for motor fuel is about the same, but the composition of the oil is quite different. The low-temperature process yields saturated and unsaturated paraffins, hydrocarbons, naphthalenes and complex aromatic hydrocarbons; the high-temperature process yields benzol, toluol and xylol.

The total yield of tar at low temperatures is about twice that obtained at high temperatures, but the ammonia yield is only one-third to one-half as much.

These comparisons apply to externally heated retorts. Internal heating dilutes the light oil vapors to a point where recovery is impracticable by present methods and produces large volumes of gas of low calorific value.

Results of observations of various processes for the low-temperature carbonization of coal are contained in Bureau of Mines technical paper 396, by A. C. Fieldner, which may be obtained from the Superintendent of Documents, Washington, at a price of 15 cents.

While coal production for the week ended Dec. 18 fell off sharply from immediately preceding weeks, it nevertheless placed the total for the year to date at the highest figure reached since 1918. The amount this year is 557,490,000 net tons, compared with 504,245,000 tons last year. It is possible that the total for the year will make a new record. In any case it will be very close to the 1918 aggregate.

Referring to the copper industry, Dr. Henry Mace Payne, consulting engineer to the American Mining Congress, says 250,000,000 lb. of copper have been used by the automobile industry this year, while 20,000,000 lb. have been used by the radio industry.

After a seven-year shutdown, operators in Clay and Coosa Counties, Alabama, are again producing graphite.

Chamber of Commerce Favors Income Tax Reduction

The necessity of reducing the corporation income tax and of repealing the estate tax and certain excise taxes was strongly emphasized by the committee on taxation of the Chamber of Commerce of the United States. It reported unanimously that it believes that "for the present all payments made by foreign governments to the United States on account of both principal and interest of their debts should be applied to the retirement of the national public debt."

The report continues: "This calendar year at the rate of 13 per cent on net profits, it is estimated that the corporations will pay to the national Government about $1,200,000,000 in income taxes. The estimated surplus for the fiscal year is sufficient to permit of an immediate reduction to 10 per cent. Next year, if this particular provision of the revenue act is not changed, corporations must pay at the rate of 13½ per cent on income, thus further increasing the present burden of taxation and paying into the Treasury still larger sums which are not necessary to meet the current expenses of government."

"At the present time," the report adds, "the majority of those paying individual income taxes pay at the minimum rate of 1½ per cent, yet these numerous taxpayers are assessed at the rate of 13 per cent on all income received from corporations in the form of dividends.

"In 1924 the dividends reported by individual taxpayers paying on $10,000 or less of income amounted to $925,000,000. To pay this tax required profits of $1,057,000,000 on which $132,000,000 in corporation taxes were paid. The maximum tax on the same profits had they been taxed to the same individuals would not have exceeded $18,000,000, or $114,000,000 less than the corporations paid.

"The characteristic American method of doing business is by means of corporate organization. Since the corporations must earn and provide a large proportion of individual income upon which the personal income tax is based, the proper adjustment of the corporation tax is of essential importance. It is manifest that a burdensome levy on the sources of production must inevitably discourage enterprise and business expansion and result in the curtailment of earnings."

Little Concern Over April 1 Coal Strike

In a review of the mining industry for 1926 in the December *Mining Congress Journal* Dr. Henry Mace Payne, consulting engineer to the congress, says that should there be a shutdown of union bituminous mines on April 1, when the present wage agreement expires, the non-union mines can produce between 8 and 8½ million tons of coal a week, against a weekly demand of 10½ million tons, with from 55 to 60 million tons to draw from storage.

He says the English coal strike caused ocean freight rates to advance $7 per ton. "This appears to be a foolish policy," he says, "since the $7 margin would have put American coal into many new ports and enabled us to bunker many vessels now using foreign coal.

"Western coal fields," Doctor Payne says, "are practically all working on a cooperative basis or modified unionism. Alabama producers have a good selling organization. In Kentucky and Tennessee operators are paying 5 per cent more than the union wage scale. The State licensing law of Illinois has served to prevent any but union mines from operating. Western Pennsylvania, once strongly union, is now largely non-union."

November production of automobiles in Canada, as reported to the Department of Commerce by the Dominion Bureau of Statistics, included 6774 passenger cars and 3054 trucks.

Exports and Imports Both High

Imports in 11 Months Greatest Since 1903—November Exports, Largest in 34 Months, Up 27 Per Cent from October

WASHINGTON, Dec. 24.—Establishing a 23-year record, imports of iron and steel into the United States during the 11 months ended November, 1926, amounted to 1,035,531 gross tons, being higher than for any year since 1903, when the total was 1,719,548 tons. With another month to go, imports for the calendar year 1926 promises to run close to 1,120,000 tons. Imports during the 11 months ended November, 1925, amounted to 844,958 tons. Imports in November of the present year totaled 81,259 tons, as against 81,830 tons in October and 79,771 tons a year ago.

Imports of Iron and Steel in Gross Tons

	Total Imports	Pig Iron	Ferro-alloys	Manganese Ore and Oxide*
Calendar year 1924...	556,814	209,109	59,910	255,157
January, 1925	77,105	41,344	7,165	15,498
February	92,353	47,803	10,997	9,666
March	92,115	50,803	5,691	24,330
April	71,233	33,299	7,699	14,941
May	67,789	21,260	8,721	29,139
June	82,853	35,657	4,259	20,720
Fiscal year 1925.....	749,393	325,199	77,291	186,939
July	64,642	24,881	3,601	28,586
August	68,489	30,707	3,526	34,168
September	68,445	29,917	3,594	22,709
October	80,045	37,709	11,226	23,054
November	79,771	34,712	6,173	33,238
December	98,400	53,333	7,703	36,908
Calendar year 1925...	943,240	441,425	80,269	265,688
January, 1926	79,067	48,428	3,055	37,498
February	100,273	59,122	5,194	27,239
March	93,107	54,825	4,606	27,391
April	107,636	54,359	6,949	59,666
May	108,731	57,211	3,002	21,633
June	124,215	43,106	5,277	31,315
Fiscal year 1926.....	1,080,781	528,305	64,106	388,407
July	82,411	32,206	1,702	34,133
August	91,578	26,538	4,611	41,075
September	85,484	17,508	2,525	18,167
October	81,830	18,847	4,879	13,331
November	81,259	17,560	6,057	20,091
Eleven months	1,035,531	559,365	48,057	327,252

*Not included in "total imports." These figures are for manganese contents of the ore.

Exports of Iron and Steel in Gross Tons

	All Iron and Steel	Pig Iron	Semi-Finished Material
*Average, 1912 to 1914...	2,406,218	221,582	145,720
*Average, 1915 to 1918...	5,295,333	438,462	1,468,020
*Average, 1919 to 1923...	3,078,724	123,837	149,218
Calendar year 1924.....	1,805,073	41,478	114,417
January, 1925	141,777	1,298	5,764
February	102,299	1,413	7,516
March	155,384	2,037	7,951
April	155,375	1,632	6,831
May	150,612	2,316	7,360
June	136,847	2,507	7,804
Fiscal year 1925.....	1,663,084	29,563	107,988
July	139,861	2,348	10,701
August	188,465	5,944	8,024
September	136,791	3,349	8,186
October	141,817	2,874	8,432
November	171,134	4,272	16,783
December	142,209	2,626	12,282
Calendar year 1925.....	1,762,571	32,674	108,681
January, 1926	174,585	1,663	4,388
February	157,187	1,478	5,615
March	169,438	1,489	6,050
April	194,449	2,010	7,167
May	173,418	1,107	9,880
June	159,506	1,369	5,714
Fiscal year 1926.....	1,948,860	30,587	103,271
July	194,717	2,595	14,558
August	171,588	2,744	14,437
September	182,071	2,173	12,569
October	172,070	2,205	13,983
November	219,830	3,724	17,528
Eleven months	1,968,859	22,557	111,889

*Calendar years.

As stated in THE IRON AGE of Dec. 23, page 1802, exports in November, 1926, amounting to 219,830 tons, represented the highest monthly outgoing movement since January, 1924, when the total was 247,343 tons. For the 11 months ended November, 1926, exports amounted to 1,968,859 tons, so that for the calendar

Destination of Iron and Steel Exports from the United States

(In Gross Tons)

Country of Destination	Nov., 1926	Jan. Through Nov. 1926	Jan. Through Nov. 1925
North and Central America and West Indies	*107,470*	*1,033,059*	*866,595*
Canada and Newfoundland...	81,560	782,484	561,692
Cuba	10,168	83,984	136,173
Mexico	7,282	94,164	95,695
Guatemala	598	9,859	6,673
Salvador	3,224	15,854	15,068
Panama	1,314	8,060	13,926
British West Indies.....	1,519	9,295	8,796
Other West Indies.....	1,157	16,030	15,385
Other Central America.....	648	13,329	13,187
South America	*48,584*	*326,667*	*296,020*
Argentina	7,030	53,655	83,240
Brazil	11,735	52,855	43,257
Chile	4,650	56,324	42,133
Colombia	10,879	60,709	72,335
Peru	5,413	34,888	15,287
Venezuela	8,020	57,806	29,921
Other South America.....	857	10,430	9,847
Europe	*12,913*	*126,541*	*132,481*
France	343	8,934	8,140
Italy	9	22,747	41,505
Rumania	76	2,421	1,299
Russia	7	2,870	1,528
Turkey	262	3,013	1,788
United Kingdom	7,957	58,490	47,527
Other Europe	4,259	28,066	30,694
Far East	*49,008*	*465,198*	*298,441*
Australia	4,090	27,064	20,406
British Malaya	3,570	14,020	5,634
China	7,612	39,385	55,245
Dutch East Indies.....	3,922	37,320	24,048
India	5,482	35,436	22,300
Japan and Chosen.....	19,105	227,556	118,669
Kwangtung	125	20,003	1,765
Philippine Islands	3,806	53,605	42,496
Other Asia and Far Eastern markets	1,296	10,809	7,878
Africa	*1,855*	*17,394*	*26,826*
British South Africa.....	961	8,898	22,216
Egypt	473	5,588	3,183
Portuguese East Africa.....	367	2,295	889
Other Africa	54	613	538
Total	219,830	1,968,859	1,619,625

Imports of Iron and Steel Products Into the United States by Countries of Origin

(In Gross Tons)

From:	Nov., 1926	Jan. Through Nov., 1926	Oct., 1926
Austria	82	727	69
Belgium	24,227	212,712	21,217
Czechoslovakia	418	1,754	26
Denmark	.....	2,409	.....
France	9,849	121,540	8,141
Germany	21,802	249,725	21,574
Italy	67	902	166
Lithuania	.....	1,530	.....
Netherlands	4,228	86,205	6,822
Norway	2,779	15,150	1,045
Poland and Danzig.....	77	1,877	984
Sweden	1,099	25,530	2,588
United Kingdom	3,790	123,710	4,951
Other Europe	31	856	2
Europe	*68,449*	*844,627*	*67,585*
Canada	10,778	83,327	10,181
Panama	.....	7,748	.....
Mexico	.....	8,061	.....
Cuba	.....	9,357	3,600
Other America	149	631	7
America	*10,927*	*109,124*	*13,788*
India	1,879	81,735	454
Other Asia	4	45	3
Algeria and Tunis.....	.....	7	.....
Total	81,259	1,035,531	81,830

year they will substantially exceed the 2,000,000-ton mark, and will be the highest yearly export movement since 1921, when the total was 2,213,042 tons. The aggregate exports for 1923 amounted to 1,992,595 tons.

Of the export movement for November, sharp gains were made over October in such products as steel rails, boiler tubes and welded pipe, plates, galvanized sheets and steel bars. That there was a consistency in the gain in these products is shown by the increases they made during the 11 months ended November, 1926, when compared with the corresponding period of 1925:

Sources of American Imports of Iron Ore

(In Gross Tons)

	November		Eleven Months Ended November	
	1926	1925	1926	1925
Spain	.....	6,231	82,412	144,401
Sweden	.....	13,849	39,491	121,001
French Africa	19,883	.....	305,845	.....
Canada	40	615	16,428	7,335
Cuba	22,000	58,500	489,000	472,630
Chile	121,800	159,100	1,253,400	971,900
All others	22,112	8,108	163,830	233,333
Total	185,835	246,403	2,350,406	1,950,600

United States Imports of Pig Iron by Countries of Shipment

(In Gross Tons)

	November		Oct., 1926	Eleven Months Ended Nov., 1926
	1926	1925		
United Kingdom	4	8,325	.....	92,039
British India	1,879	12,567	454	81,325
Germany	9,701	3,550	12,565	146,101
Netherlands	2,955	8,991	4,800	65,055
Canada	530	429	398	4,719
France	1,116	100	.....	27,949
Belgium	1,350	600	.....	7,488
All others	25	150	630	6,143
Total	17,560	34,712	18,847	430,819

Imports of Iron and Steel Into the United States

(In Gross Tons)

	November		Eleven Months Ended November	
	1926	1925	1926	1925
Pig iron	17,560	34,712	430,819	388,092
Ferromanganese(a)	4,365	5,827	36,273	68,164
Ferrosilicon	1,692	346	11,784	4,412
Scrap	7,661	13,160	80,489	89,397
Pig iron, ferroalloys and scrap	*31,278*	*54,045*	*559,365*	*550,065*
Steel ingots, blooms, billets and slabs	639	2,405	29,074	25,448
Iron blooms, slabs, etc.	.....	.....	323	.....
Wire rods	1,190	955	9,206	7,333
Semi-finished steel	*1,829*	*3,360*	*38,603*	*32,781*
Rails and splice bars	2,078	1,359	61,794	36,627
Structural shapes	15,348	4,837	110,645	73,495
Boiler and other plates	259	152	4,151	794
Sheets and saw plates	1,170	213	9,056	3,208
Steel bars	7,785	5,771	98,256	52,307
Bar iron	456	757	4,939	10,910
Hoops, bands and cotton ties	4,312	.....	25,522	.....
Tubular products (wrought)(b)	5,029	7,895	25,763	71,064
Nails, tacks, staples	714	323	4,898	2,681
Tin plate	41	62	2,091	328
Bolts, nuts, rivets and washers	5	4	356	104
Round iron and steel wire	442	453	3,824	3,810
Barbed wire	176	.....	2,850	.....
Flat wire; strip steel	411	169	3,938	1,969
Steel telegraph and telephone wire	90	.....	1,125	.....
Wire rope and strand	106	207	2,431	2,005
Other wire	47	.....	1,478	.....
Wire cloth and screening	33	.....	313	.....
Rolled and finished steel(b)	*38,502*	*22,202*	*363,430*	*259,302*
Cast iron pipe	9,378	(c)	71,779	(c)
Castings and forgings	272	164	2,353	2,810
Horseshoes	.....	.....	1	.....
Total	81,259	79,771	1,035,531	844,958
Manganese ore(a)	20,091	33,238	327,252	228,780
Iron ore	185,835	246,403	2,350,406	1,950,600
Magnesite	2,132	801	66,685	75,380

(a) Manganese content only, except shipments of ore from Cuba, which are stated in gross weight.

(b) Prior to January, 1926, this includes some cast iron pipe, under the heading "tubular products."

(c) Included under "tubular products."

Tin plate showed a notable gain, with a total of 219,001 tons, against 148,382 tons for the 11 months in 1925.

Of the 16,301 tons of plates exported in November, Canada took 13,209 tons, and for the 11 months plates exported to Canada totaled 105,509 tons out of the entire export movement of 129,452 tons of this product. Canada was the leading destination of exports of galvanized sheets in November, and in the 11 months ended with November, taking 3026 tons and 40,782 tons respectively. Black steel sheets, steel bars and plain heavy structural material were likewise shipped to Canada in greater quantities during both periods than to any other country.

Japan was the leading country of exports of tin plate in November, taking 5931 tons, and was second largest buyer of this product during the 11 months, taking 41,616 tons, against 43,263 tons taken by Canada. Japan led as the destination of exports of rails from the United States during the 11 months, taking 28,235 tons, as against 25,716 tons taken by Canada.

Canada easily led as the greatest recipient of total exports, both in November and the 11 months ended November, taking 81,485 tons and 781,560 tons respectively. Japan was second for both periods, taking 19,105 tons and 227,556 tons.

Of the heavy imports during the 11 months ended November of the present year, 430,819 tons consisted of pig iron, representing a gain of 42,727 tons over the corresponding period of 1925. Germany led as the source of pig iron imports for the 11 months of 1926, providing a total of 146,101 tons. The United Kingdom ranked second with 92,039 tons. Pig iron imports in November, however, declined to 17,560 tons, against 18,847 tons in October. Germany was also the leading source of November imports of pig iron, furnishing 9701 tons, while there were only four tons shipped from the United Kingdom, a fact explained by the coal strike.

Exports of Iron and Steel from the United States

(In Gross Tons)

	November		Eleven Months Ended November	
	1926	1925	1926	1925
Pig iron	3,724	4,272	22,557	29,990
Ferromanganese	70	173	632	4,323
Scrap	6,234	6,352	96,936	78,866
Pig iron, ferroalloys, and scrap	*10,028*	*10,797*	*120,125*	*113,179*
Ingots, blooms, billets, sheet bar, skelp	14,981	15,236	95,038	77,031
Wire rods	2,547	1,547	16,851	19,324
Semi-finished steel	*17,528*	*16,783*	*111,889*	*96,355*
Steel bars	15,028	10,973	126,818	102,063
Alloy steel bars	463	42	4,605	3,124
Iron bars	571	232	4,797	4,353
Plates, iron and steel	16,301	10,983	129,452	94,510
Sheets, galvanized	19,223	15,607	161,473	147,857
Sheets, black steel	15,368	11,281	156,095	84,074
Sheets, black iron	1,300	1,254	16,635	12,918
Hoops, bands, strip steel	4,372	4,057	43,703	36,933
Tin plate; terne plate	28,116	20,328	219,001	148,384
Structural shapes, plain material	15,482	12,247	146,504	94,699
Structural material, fabricated	4,259	9,799	70,965	66,510
Steel rails	23,385	7,136	168,315	147,406
Rail fastenings, switches, frogs, etc.	3,343	1,691	38,915	33,522
Boiler tubes, welded pipe and fittings	31,188	19,871	255,664	220,985
Plain wire	1,709	2,215	29,433	32,775
Barbed wire and woven wire fencing	2,956	5,889	49,127	65,244
Wire cloth and screening	188	161	1,813	1,658
Wire rope and cable	490	413	4,446	4,062
Wire nails	704	1,114	11,115	8,892
Other nails and tacks	492	841	7,394	8,376
Horseshoes	56	31	627	623
Bolts, nuts, rivets and washers, except track	929	1,261	12,295	15,483
Rolled and finished steel	*185,923*	*137,426*	*1,659,192*	*1,334,451*
Cast iron pipe and fittings	2,834	2,817	30,929	29,818
Car wheels and axles	1,234	1,449	15,969	18,826
Iron castings	571	450	8,431	9,591
Steel castings	498	125	7,009	3,956
Forgings	90	202	2,500	2,062
Castings and forgings	*5,227*	*5,043*	*64,838*	*64,253*
All other	1,124	1,085	12,815	11,387
Total	219,830	171,134	1,968,859	1,619,625

Of the 15,348 tons of plain structural shapes imported in November, 10,906 tons came from Belgium; 2837 tons from Germany and 1152 tons from France. Of the 9378 tons of cast iron pipe imported in November, 4440 tons came from Germany; 3162 tons from Belgium; 282 tons from Czechoslovakia; 279 tons from Canada and 46 tons from France. Imports of hoops and bands in November totaled 4312 tons, of which 1792 tons came from Germany; 1010 tons from the United Kingdom; 914 tons from Belgium and 497 tons from the Netherlands.

Belgium supplied 1793 tons of the 1997 tons of rails imported in November, while 191 tons came from Germany. Steel bar imports in November amounted to 7785 tons, the principal countries of origin being Belgium, 4443 tons; France, 1300 tons; Germany, 976 tons; Sweden, 540 tons, and the Netherlands, 350 tons. Ferromanganese imports in November totaled 4365 tons.

Supplying 24,227 tons, Belgium led as the source of all iron and steel imports in November, while Germany came second for that month, with 21,802 tons. For the 11 months, Germany was first, with 249,725 tons, while Belgium was second, with 212,712 tons.

STEEL CASTINGS

November Bookings Lower, But 11 Months Total Well Above 1925

Aggregating 68,545 net tons, bookings of commercial steel castings in November represented 53 per cent of capacity, according to reports received by the Department of Commerce from 108 firms with a present monthly capacity of 128,470 tons. This covers 80 per cent of the commercial steel castings capacity of the United States, of which 59,200 tons are usually devoted to railroad specialties and 69,270 to miscellaneous castings. Bookings in October amounted to 72,399 tons, or 56 per cent of capacity. In November of 1925 the bookings were 83,197 tons, or 66 per cent of capacity.

Of the November, 1926, bookings, 28,079 tons were for railroad specialties, representing 47 per cent of that capacity, while 40,466 tons were for miscellaneous purposes, representing 58 per cent of this kind of capacity.

Bookings for the 11 months ended Nov. 30 totaled 884,474 tons, against 800,115 tons for the corresponding period of 1925. Railroad bookings for the 11 months of the current year amounted to 341,453 tons, compared with 325,979 tons for the corresponding period of last year. Bookings of miscellaneous castings for the two respective periods were 543,021 tons and 474,136 tons.

11-Month Production Close to 1,000,000 Tons

Production of commercial steel castings in November of the present year amounted to 84,685 tons, or 66 per cent of capacity, against 77,537 tons in October, or 60 per cent of capacity. Of the November production, 24,362 tons were for railroad specialties, representing 41 per cent of that class of capacity, while production of miscellaneous castings in November totaled 60,323 tons, or 87 per cent of capacity. Production for the 11 months ended November aggregated 990,021 tons, of which 372,107 tons were railroad specialties and 617,914 tons were miscellaneous castings.

Factory Earnings Increase

Average weekly earnings in representative New York factories are reported by the State Industrial Commissioner to have been $29.35 in October. This is the highest figure ever reported, replacing the previous high level of $29.31 in September. The average for the first ten months of this year was $28.96, against an average of $28.26 in 1925 and a previous high of $28.15 in 1920. The lowest month of 1926 was February, with $28.61 per week.

November Fabricated Plate Bookings Largest Since April, 1923

Fabricated steel plate bookings in November totaled 50,863 net tons, representing 68 per cent of capacity, according to reports received by the Department of Commerce from 45 firms. This compares with 41,314 tons booked in October, or 53 per cent of capacity, and forms the largest month since April, 1923. Of the November bookings, 19,111 tons were for oil storage tanks; 2141 tons for refinery materials and equipment; 17,784 tons for tank cars (the largest amount in four years or more); 1821 tons for gas holders; 363 tons for blast furnaces and 9643 tons for stacks and miscellaneous purposes.

For the 11 months ended Nov. 30 bookings aggregated 442,819 tons, against 333,414 tons for the correspondnig period of 1925; 278,431 tons for the corresponding period of 1924 and 534,417 tons for the corresponding period of 1923.

British Iron and Steel Exports Less While Imports Show Gain

WASHINGTON, Dec. 24.—Failing to sustain the partial recovery made in October, exports of iron and steel from Great Britain decreased in November, while imports increased, according to a cablegram received by the Department of Commerce from Commercial Attaché William L. Cooper, London. Imports during November, 422,679 gross tons, were larger by 24,444 tons or 6.1 per cent than in October. Exports decreased to 166,363 tons, a decline of 27,702 tons or 14.3 per cent under October.

Pig Iron Showed Largest Gain

Twelve items in the import classification reported gains in tonnage in November as against October, while but seven groups reported losses. Of the 22 classifications of exports, eight recorded increases and 14 losses. Receipts of pig iron increased by the greatest amount, 17,442 tons, during November; plates and sheets held second place, with 6527 tons. Imports of steel bars increased 5254 tons; structural steel, 2655 tons; wrought tubes, 1620 tons; cast tubes, 1074 tons, and iron bars, 1037 tons. The remaining five items recording increases were rails, railroad materials other than rails, wire nails and tacks and "all other manufactures of iron and steel."

Imports of ingots and blooms, however, decreased by 9360 tons and receipts of hoops and strips declined 3637 tons. Shipments of wire nails, miscellaneous wire manufactures, bolts, nuts, iron and steel forgings and castings all showed losses in November.

Changes in Exports

Of the 14 classifications of exports reporting decreases during November galvanized sheets and tin plate, with losses of 11,690 tons and 4273 tons respectively, held first and second places. Both these losses were unlooked for, inasmuch as these two items had, in October, shown the greatest increases in tonnage of all the classifications of exports. The group "all other manufactures of iron and steel" decreased by the third largest amount, 2595 tons, and was followed by wrought tubes, which lost 2448 tons; cast tubes, 1996 tons; wire, 1613 tons; plates and sheets, 1566 tons; and rails, 1171 tons.

Other items reporting losses, though in smaller amounts than the foregoing, were ingots and blooms, iron bars, structural steel, hoops and strips, nails and tacks, and bolts and nuts. To offset these losses at least in part, exports of miscellaneous railroad materials increased 1039 tons; shipments of pig iron, 396 tons; miscellaneous wire manufactures, 204 tons. Steel bars, wire cables and rope, wire nails, and iron and steel castings and forgings in the rough all increased, though by lesser amounts.

Machinery Markets and News of the Works

HOLIDAY QUIET PREVAILS

Machine Tool Trade at Low Ebb But Prospects for 1927 Are Encouraging

Reports Generally Agree That 1926 Has Been an Exceptionally Good Year, With Automotive Industry Leading Buyer

MACHINE tool business in 1926 is being brought to a close under the conditions of low volume of activity that usually prevail through the holiday period. December business probably will show a falling off from that of November.

The year as a whole has produced a satisfactory business for nearly all manufacturers of tools. Some of the Cincinnati tool builders estimate that sales this year have run 10 or 15 per cent ahead of those of 1925.

Automobile manufacturers bought the largest amount of equipment of any single unit, but the demand from the general industrial field has been very good. Railroad buying was in disappointingly small volume, although a number of roads bought fairly good-sized lists.

With a substantial amount of business pending, the tool trade looks to 1927 with optimism, believing that if general business conditions maintain anything like their present status the year-end falling off in orders will be compensated for in the early months of the new year.

New York

NEW YORK Dec. 27.

HOLIDAY dullness has marked the past week in the local machine tool market, but there is a fair amount of inquiry pending which leads to expectations of an upward trend in orders as soon as the new year has fairly begun. December business has been at a rate probably lower than that of November.

Among recently reported sales of tools are a 60-in. x 26-ft. engine lathe to the Crocker-Wheeler Co., Ampere, N. J., a 5-ft. radial drill and an upright drill to the Chateaugay Ore & Iron Co., Standish, N. Y., a keyseater to the Sullivan Machinery Co., Claremont, N. H., a thread miller to Jones & Lamson, Springfield, Vt., a bench miller to a Poughkeepsie, N. Y., electric manufacturer, a thread miller to an Elkhart, Ind., tool maker, a jig boring machine to a motor car manufacturer in Detroit, a hand miller to a Detroit machinery builder, four 16-in. lathes to a Kohler, Wis. company and a 30-in. profiler to a Phillipsburg, N. J. company. Purchases by railroads have included a 90-in. locomotive journal turning lathe and a carwheel lathe to the Norfolk & Western, a 16-in. lathe to the Monongahela Railway Co. and a 13-in. lathe to the New York Rapid Transit Co.

The Atlantic Machinery Exchange has started in business at 212-216 Centre Street, New York, dealing in machinery, tools, and motors. D. Zeisel and S. Gellman are the owners.

Plans have been filed by the Rubel Coal & Ice Co., 197 Glenmore Avenue, Brooklyn, for a new one-story ice-manufacturing plant, 125 x 200 ft., at Long Island City, to cost approximately $150,000 with equipment. Edward M. Adelsohn, 350 Stone Avenue, Brooklyn, is architect.

Officials of the International Paper Co., 100 East Forty-second Street, New York, are organizing a subsidiary to be known as the Arkansas Fiber & Paper Co., capitalized at close to $5,000,000. Plans are under way for a new mill on the Ouachita River, Camden, Ark., for the manufacture of kraft papers. Natural gas will be used for a portion of power requirements. It is purposed to begin work in about 30 days and have the plant completed by the end of 1927. It will cost more than $2,000,000. Later the company proposes to expand the mill for the production of wallboard products and paper containers. A. R. Graustein is head of the parent organization.

The superintendent of lighthouses, Staten Island, N. Y., is asking bids until Jan. 6 for 100 acetylene flashers or automatic devices to control the flow of acetylene gas for lighting service.

The Sun Rise Lamp Mfg. Co., 353 Canal Street, New York, manufacturer of lighting fixtures and accessories, has leased space in the building at 632 Broadway, for a new plant and will begin operations soon.

M. Joseph Harrison, World Building, New York, architect, has completed plans for a four-story automobile service, repair and garage building, 50 x 100 ft., at 420-22 West Thirty-seventh Street, to cost close to $100,000 with equipment.

The Paerdergat Ice Corporation, 783 East Forty-second Street, Brooklyn, has plans under way for a one-story addition, 60 x 100 ft., to its ice-manufacturing plant, to cost approximately $60,000. Burke & Olsen, 32 Court Street, are architects. Frank Vennoia is president.

Following its recent purchase of the plant and business of the Crescent Washing Machine Co., New Rochelle, N. Y., the Hobart Mfg. Co., Troy, Ohio, manufacturer of food choppers, cutters, etc., has arranged for a stock issue to total $1,879,900, the proceeds to be used in part to carry out the merger and for proposed expansion. A. G. Stouder is president.

Glick & Dumas, 400 East Fordham Road, New York, architects, are preparing plans for a four-story automobile service, repair and garage building, 100 x 150 ft., at 157th Street and Riverside Avenue, to cost $130,000 with equipment.

The Board of Transportation, 49 Lafayette Street, New York, is arranging a construction program for the subway system during 1927, to include a terminal yard and shops at 207th Street, to cost $2,000,000.

The Brooklyn Edison Co., 380 Pearl Street, Brooklyn, has plans for a new six-story equipment, repair and garage building, 153 x 190 ft., at 300-38 Fourth Avenue, to cost $1,200,000 with machinery. McKenzie, Voorhees & Gmelin, 342 Madison Avenue, New York, are architects.

The Central Hudson Gas & Electric Corporation, Poughkeepsie, N. Y., recently formed by a merger of the Central Hudson Gas & Electric Co., United Hudson Electric Corporation and other light and power interests, will issue bonds for $10,050,000, a portion of the proceeds to be used for extensions and improvements.

Fire, Dec. 21, destroyed a portion of the Connewey Electric Laboratories, 406-8 Jefferson Street, Hoboken, N. J., manufacturer of radio equipment, with loss estimated at $25,000, including equipment. Plans for rebuilding are under consideration.

The Standard Oil Co. of New Jersey, 26 Broadway, New York, has awarded a general contract to the Donnell-Zane Co., 233 Broadway, New York, for a new two-story building, 66 x 150 ft., at its refinery at Bayonne, N. J., to be equipped largely as a press shop for the wax division. It is reported to cost in excess of $75,000 with machinery.

The Flintkote Co., Rutherford and Little Ferry, N. J., manufacturer of roofing products, has concluded negotiations for the purchase of the Richardson Co., Cincinnati, Chicago and New Orleans, and the Chatfield Mfg. Co., Cincinnati, both manufacturers of similar roofing specialties, and will consolidate with its organization. Increase in manufacture is planned. The purchasing company has arranged for a preferred stock issue of $2,500,000 to carry out the consolidation and expansion. It is understood that a plant will be maintained at Cincinnati, in addition to present factories.

The Buick Motor Co., 497 Broad Street, Newark, has leased a new two-story building, 50 x 100 ft., to be

erected at Hayes Circle, Elizabeth Avenue, Brunswick and Wright Streets, with one-story extension, 145 x 145 ft., the latter portion to be equipped for service, parts and repair work. The project will cost about $200,000. William E. Lehman, 972 Broad Street, is architect.

The Hanson-Van Winkle Co., Chestnut and Van Buren Streets, Newark, manufacturer of dynamos and other electrical apparatus, will ask bids early in January for extensions and improvements in its proposed new plant, comprising the former works of the Atha Steel Co., estimated to cost $500,000. The present business will be removed to the new location and additional equipment installed. Fletcher-Thompson, Inc., 415 Lexington Avenue, New York, and 542 Fairfield Avenue, Bridgeport, Conn., is architect and engineer.

New England

BOSTON, Dec. 27.

NO business of importance was transacted locally the past week, and little, if any, improvement is expected until well into January and possibly later. The general sentiment for 1927, however is for larger bookings than those in 1926. There are several fundamental market factors making for optimism in the trade among which may be mentioned: Practically all machinery interests have more real inquiries in hand than a year ago, no lists are out, but a majority of inquiries cover tools averaging fairly high in price; there is a limited supply of really good used machinery on the market; almost all lines of New England business involving machine tools are in need of additional equipment to meet growing competition, and it is generally believed the textile machinery and boot and shoe industries will have a more satisfactory year than in 1926, and that both industries will require metal-working tools.

Work is about to start on a cold storage warehouse for J. J. Rourke & Son., 261 Canal Street, Providence, R. I., for which conveying equipment is required. Plans are private.

The Somerville Machine & Foundry Co., 14 Kent Street, Somerville, Mass., is taking bids for a one-story, 40 x 80 ft., plant. Daniel Cormier, 15 Herbert Street, Somerville is the architect.

The Davis-Warner Arms Corporation, Norwich, Conn., capitalized for $100,000 has been incorporated to take over the Davis Arms Corporation and will manufacture firearms, ammunition and machinery. Franklin B. Warner, Charles Chester Warner and Marvin Warner are the incorporators.

The Durand Steel Locker Co., Inc., 33 South Clark Street, Chicago, manufacturer of lockers, shelving, bins and racks, will open a branch office at 201 Devonshire Street, Boston, Jan. 1, where a full line of its products will be carried. Mr. Bonaventure will be in charge.

The New England Metal Products Corporation, Bridgeport, Conn., is being reorganized and will change its name to the New England Metal Products, Inc., and the capitalization from 1000 shares of no par value to 3000 shares of preferred stock, $100 par value, and 10,000 shares of common, no par value.

Contract has been let by the New Haven Clock Co., 139 Franklin Street, New Haven, Conn., to Frank Taglialetila, New Haven, for a one-story addition, 25 x 100 ft., to cost about $21,000.

The Packard Motor Car Co., 150 Washington Street, Hartford, Conn., is completing plans for the construction of a two-story service, repair and garage building, 140 x 150 ft., to cost close to $140,000 with equipment. Smith & Bassette, 36 Pearl Street, are architects.

The Board of Middlesex County Commissioners, Cambridge, Mass., is completing plans for a one-story power house, to cost in excess of $150,000 with equipment. E. C. Brown & Co., 220 Devonshire Street, Boston, are engineers.

The United Illuminating Co., New Haven, Conn., is arranging a construction and improvement program to include extensions in power plants, transmission lines, etc. Arrangements are being made for an increase in capital of close to $2,000,000 to provide funds for the work.

The Connecticut Light & Power Co., Waterbury, Conn., has plans under consideration for an addition to its steam-operated electric generating station at Devon, Conn., to cost about $200,000 with equipment. The expansion will be carried out in connection with the furnishing of service to the New York, New Haven & Hartford Railroad.

The Metal Products Co., West Haven, Conn., has plans for a new one-story factory, 35 x 125 ft., to cost about $24,000 with equipment.

The Standard Oil Co., Thamesville, Conn., has plans for extensions and improvements in its local oil storage and distributing plant, to include a new pumping plant and addition to power station.

The plant of the Luxor Cab Mfg. Co., Framingham, Mass., heretofore devoted to the manufacture of taxi cabs, has been acquired by the R. H. Long Operating Co., Framingham, at a public sale for $150,000. The new owner is reported to be planning to use the works for mechanical service, the exact character of which is temporarily withheld.

Cleveland

CLEVELAND, Dec. 27.

MACHINE tool sales were fairly good the past week despite the holiday period. A Detroit automobile manufacturer purchased 13 turret lathes from a Cleveland manufacturer, who also booked an order for two lathes for the Pacific Coast. A few orders for single machines were placed and action on other single tool inquiries was postponed until next month. The General Electric Co. placed two turret lathes for its Erie works.

The Akron Mirror & Plate Glass Co., 180 East South Street, Akron, Ohio, has placed contract for a factory, 50 x 100 ft. George Ball, 518 Metropolitan Building, Akron, is the architect.

The Ohio State Department of Highways has placed contract for a one-story garage, 80 x 200 ft., to be erected at New Philadelphia, Ohio. Herman Briggs, Hartman Hotel Building, Columbus, is the architect.

The Champion Equipment Co., Kenton, Ohio. has been organized with a capital stock of $250,000 to purchase the Champion Engineering Co. of that city and will carry on the manufacture of electrical overhead cranes, gantry cranes, hydro-electric equipment and other machinery. All sales and engineering of the company are transacted by Philips & Davies, Kenton.

Philadelphia

PHILADELPHIA, Dec. 27.

THE Pennsylvania Railroad Co., Philadelphia, is said to be planning the installation of new tools at its car shops at Altoona, Pa., including punches, shears, etc.

The Philadelphia Electric Co., Tenth and Chestnut Streets, Philadelphia, has asked bids on a general contract for two power substations, to cost in excess of $125,000 with equipment. John T. Windrim, Commonwealth Building, is architect.

The Atlas Electric Co., Inc., Philadelphia, has been organized with a capital of $35,000 to take over and expand the company of same name at 1218 Hamilton Street, Philadelphia. J. G. McMahon is treasurer.

The Roberts Filter Co., 611-13 Columbia Avenue, Darby, Pa., manufacturer of water filters, filtration apparatus, etc., plans to rebuild the portion of its plant, destroyed by fire Dec. 18, with loss reported in excess of $250,000 including machinery.

The Ideal Chair Co., 1406 Metropolitan Avenue, Brooklyn, N. Y., has leased a two-story factory to be constructed at Water and Ritner Streets, Philadelphia, for a new plant, to cost close to $50,000 with equipment.

The Atlantic Refining Co., 260 South Broad Street, Philadelphia, plans the installation of additional equipment at its oil refineries in the Point Breeze, Pittsburgh and Franklin, Pa., districts, including pumping machinery and accessory equipment.

Following the purchase of additional interest in the Williamsport Wire Rope Co., Williamsport, Pa., by Robert Gilmore and Edgar Munson, president and general manager, and vice-president and treasurer, respectively, plans are under way for additional capitalization and increase in operations. The company is now arranging for an extension to its factory branch at Chattanooga, Tenn.

The Scranton Bed & Spring Mfg. Co., 310 Centre Street, Scranton, Pa., is considering plans for the construction of a two-story addition to cost close to $25,000.

The Wilmot Engineering Co., Markle Bank Building, Hazleton, Pa., manufacturer of iron and steel castings, coal jigs and machinery, has begun the construction of a one-story addition to its plant at White Haven, Pa., to cost about $20,000.

The Cole Township School Board, Shamokin, Pa., is said to be planning the installation of manual training equipment in its proposed high school to cost in excess of $175,000.

The Crane Market

BUT little business is being booked as the year draws to a close. Inquiries for both electric overhead and locomotive cranes, however, are in good volume and promise well for next year. The American Steel & Wire Co., Worcester, Mass., is reported to have closed on the six large overhead cranes, inquiry for which has been in the market for some time. The list of hand power jib cranes with electric hoists for Dwight P. Robinson & Co., New York, is not yet placed.

Among recent purchases are:

George M. Brewster & Son, Bogota, N. J., reported to have purchased two 30-ton locomotive cranes from the Browning Crane Co.

Essex County Hall of Records, Newark, N. J., a 10-ton, 43-ft. 6-in. span hand power crane for a power house, from the Cleveland Crane & Engineering Co.

Atlantic Creosoting Co., Norfolk, Va., a 25-ton used Browning locomotive crane from the Hoisting Machinery Co., New York.

Witherow Steel Co., Pittsburgh, a 5-ton electric traveling crane from the Bedford Foundry & Machine Co.

Aluminum Co. of America, a 100-ton overhead crane for High Rock, N. C., from the Niles Crane Corporation, and a 75-ton overhead crane for Alcoa, Tenn., from the Northern Engineering Works.

Eternit, Inc., St. Louis, asphalt manufacturer, five 3-motor overhead cranes and one hand power crane from the Whiting Corporation.

Loefell & Glancy, Chicago, stone cutters, a 5-ton, 1-motor overhead crane from the Northern Engineering Works.

The Northern Electric Co., Green Bay, Wis., a 25-ton and a 35-ton, 1-motor cranes for Kells, Mich., from the Northern Engineering Works.

Austin L. Reilly, Bennett Building, Wilkes-Barre, Pa., is architect.

The Lawrence Portland Cement Co., Northampton, Pa., plans to begin work early next year on its new mill at Thomaston, Me., for which plans are scheduled for completion about Jan. 15. The entire project will cost more than $1,500,000 with machinery. Frank H. Smith is president.

The H. L. Neuman Co., 30 South Newberry Street, York, Pa., is completing plans for a three-story repair and equipment storage building, 70 x 140 ft., to cost approximately $50,000. Paul Hostetter Co., Inc., Summer Street, is architect and engineer.

Michael J. Ryan has been appointed receiver of the McCaffrey File Co., Philadelphia, on petition of a stockholder who claims the company is insolvent. Joseph J. McCaffrey is president and treasurer of the McCaffrey File Co.

Gulf States

BIRMINGHAM, Dec. 27.

Plans are being completed by the City Council, Palmetto, Fla., for a new municipal electric light and power plant, for which a fund of $30,000 has been secured.

The Boykin Machinery & Supply Co., Beaumont, Tex., manufacturer of oil-well equipment, is said to be planning the early construction of an addition to its plant, 75 x 200 ft., to cost approximately $100,000 with machinery.

The Dowling Hardwood Lumber Co., Gunntown, Fla., has plans nearing completion for a new mill with capacity of approximately 150,000 ft. per day, estimated to cost $400,000 with machinery.

The Northwest Louisiana Gas Co., Inc., Shreveport, La., Charles G. Laskey, president, operating natural gas properties, pipe lines, etc., has arranged for a bond issue of $1,200,000, a portion of the proceeds to be used for expansion and betterments.

The N. O. Nelson Mfg. Co., 590 Linden Avenue, Memphis, Tenn., manufacturer of plumbing equipment and supplies, is asking bids until Jan. 4 for the erection of a new factory branch at Jackson, Miss., with storage and distributing facilities. N. W. Overstreet, Mississippi Fire Insurance Building, Jackson, is architect.

The Stockham Pipe & Fittings Co., 4100 North Tenth Avenue, Birmingham, has awarded a general contract to the H. K. Ferguson Co., Cleveland, for a one-story addition to its pipe shop and improvements in existing works, to cost about $60,000.

The City Council, Monroe, La., plans the installation of pumping machinery and other power equipment in connection with proposed extensions and improvements in the municipal waterworks estimated to cost $600,000. A special election has been called for Jan. 18 to approve a bond issue in that sum.

The Northern Texas Utilities Co., Amarillo, Tex., has arranged for a note issue of $2,500,000, the majority of the proceeds to be used for construction of pipe lines and other distributing facilities for natural gas supply. The company has contracted with the Columbian Gasoline Corporation, a subsidiary of the Columbian Carbon Co., Williamsport, Pa., to construct and operate a gasoline production plant, cost of which will be defrayed by the Columbian company. David A. Upham is president.

The Board of Trustees, Southern Methodist University, Dallas, Tex., will proceed with construction by day labor of a two-story power plant at the institution, 75 x 100 ft., to cost $50,000 with equipment. Coburn, Smith & Evans, Republic Building, are architects. E. Gordon Perry is chairman of the building committee.

The Southtex Motor Co., Edinburg, Tex., is completing plans for a new one and two-story service, repair and garage building, 100 x 135 ft., to cost close to $100,000 with equipment. Robert L. Vogler, Edinburg, is architect.

The Southwestern Light & Power Co., 72 West Adams Street, Chicago, is said to be planning the construction of a new steam-operated electric power house at Lake Pauline, vicinity of Quanah, Tex., to cost in excess of $150,000 with equipment.

The Elliott Brothers Electric Co., 215 Milam Street, Shreveport, La., is desirous of getting in touch with manufacturers of sheet metal mail boxes, suitable for residences.

The Browning-Ferris Machinery Co., Commerce Street and Exposition Avenue, Dallas, Tex., has been incorporated with a capital stock of $150,000 to buy and sell all kinds of contractors' equipment, including concrete mixers, road machinery, saw rigs, hoists and pumps. The company has warehouses at Dallas, Houston and Amarillo, Tex. W. A. Browning is president, Royal A. Ferris, Jr., vice-president and treasurer, and L. A. Levilioux, secretary.

South Atlantic States

BALTIMORE, Dec. 27.

THE Frederick Machinery Co., Frederick, Md., recently organized by James A. Rogers, Buckeystown, Md., and associates, has leased the Collins Building on West Patrick Street, and will establish a plant for the distribution and repair of farm equipment, dairy and road machinery, etc. Mr. Rogers will be president.

The Novelty Mfg. Co., Rockingham, N. C., lately formed with capital of $30,000, has leased a local building for the manufacture of metal, wood and other advertising specialties. W. A. Williams, Rockingham, is head.

In connection with a recently authorized bond issue of $10,000,000, of which $9,000,000 is to be sold at once, the Virginia Electric & Power Co., Richmond, Va., will expend close to $5,000,000 at its new steam-operated electric power plant to be located at Norfolk, Va. The work will include the installation of a 30,000-kva. steam turbo-generator, boilers, condenser, coal-handling machinery, etc. Extensions will also be made in transmission lines.

The City Council, Henderson, N. C., S. B. Burwell, city clerk, is asking bids until Jan. 12 for equipment for extensions and improvements in municipal waterworks, including pumping machinery, electrical control equipment, filtration and purification apparatus, etc. William C. Olsen, Inc., Raleigh, N. C., is consulting engineer.

The Loom Lay Patch Co., Greenwood, S. C., recently organized, is completing plans for the establishment of a local plant for the manufacture and repair of textile looms and affiliated equipment. The company is headed by John B. Sloan and Arthur Lee, both of Greenwood.

G. W. Reaves, 83 West Fifty-sixth Street, Atlanta, Ga., is inquiring for two or more 7 to 20-hp. stationary engines.

The Norfolk & Western Railway Co., Winston-Salem, N. C., is said to have plans under way for the purchase of local property for the construction of a new engine house with repair facilities, and other shop and terminal buildings, the complete project to cost more than $75,000. Headquarters are at Roanoke, Va.

The E. H. Jacobs Mfg. Co., Danielson, Conn., manufacturer of textile mill equipment, has leased a portion of the building at 501 West Palmer Street, Charlotte, N. C., for

a local branch plant. It is expected to begin operations in January. Frederick A. Jacobs and W. Irving Bullard will be in charge of the Charlotte works.

The Virginia Public Service Co., Alexandria, Va., comprising a recent merger of the Alexandria Light & Power Co. and other utilities, has concluded arrangements for the acquisition of the Newport News & Hampton Railway Gas & Electric Co., Newport News, Va. Plans are under consideration for expansion, including transmission line construction.

The Standard Machinery & Equipment Co., Spartanburg, S. C., has inquiries out for a double drum belt hoist for a 30-ton derrick.

The Five Points Automobile Co., 101 Chapel Hill Street, Durham, N. C., has awarded a general contract to George W. Kane, First National Trust Building, for the erection of a service, repair and garage building, 60 x 225 ft., to cost about $100,000 with equipment.

The Hackley-Morrison Co., Inc., 1708 Lewis Street, Richmond, Va., machinery dealer, has inquiries out for two gyratory crushers, Nos. 2 or 3, and Nos. 4 or 5; two 500-lb. pressure tanks, each about 30 in. in diameter and 78 ft. long; two 250-hp. watertube boilers to operate at 150 lb. pressure, with complete accessories, and one 8-ton industrial gasoline-operated locomotive, 36-in. gage.

The Hardie No-Kol Co., Greensboro, N. C., is inquiring for data on electric pumping apparatus for service in connection with oil-burning equipment.

The Contracting & Engineering Co., P. O. Box 38, Atlanta, Ga., has inquiries out for electrically operated floor-finishing machines.

The Maryland Truck Equipment Corporation, Box 780, Baltimore, has been organized to deal in cabs, bodies, winches, hoists, cranes, sprinklers, tanks and all sorts of equipment for trucks. The company will maintain a shop in Baltimore for the mounting of its various products, and the territory covered will include Maryland, Delaware and the District of Columbia.

Chicago

CHICAGO, Dec. 27.

THE Chicago machine tool market is quiet with the bulk of such inquiry as is now before the trade being carried over to the new year. December sales started out well compared to those in November but they have tapered off so that the total for the month is comparatively small. Last year at this time several railroads, including the Santa Fe and the Burlington, closed for a fair number of tools but this month has seen little railroad buying. Deliveries have been improving and dealers expect little or no difficulty in the way of promising satisfactory shipment should an urgent demand come shortly after the turn of the year.

The used machinery market has been dull throughout the month. The Pullman Co. has purchased the wood-working tools and structural machinery on its list and reports indicate that the machine tools will be placed in two weeks. The Mechanical Mfg. Co., Chicago, has bought three No. 2 millers and a tool-room milling machine. The Chicago Vitreous Enamel Co. has ordered a milling machine and a can company has placed a 20-in. x 18-ft. lathe.

The Adams & Westlake Co., Chicago, manufacturer of railroad signal lamps, car and ship lighting fixtures, ship hardware and automobile accessories, will move its plant to Elkhart, Ind. It is capitalized at $4,500,000. The company has been in Chicago since 1867.

The Marshall-Huschart Machinery Co., 571 West Washington Boulevard, Chicago, has established a used-machinery warehouse in a building adjacent to its offices.

The Keokuk Steel Casting Co., Keokuk, Iowa, is enlarging its plant, at a cost of $65,000.

Plans are under consideration by the Winslow Boiler & Engineering Co., Chamberlain Street, Galesburg, Ill., for a one-story and basement addition, 50 x 150 ft., to cost about $65,000 with equipment. Work will probably begin in the spring.

The Pueblo Cinder & Cement Products Co., East Tenth and Water Streets, Pueblo, Colo., is planning the construction of a one-story addition, 30 x 120 ft., a portion of the structure to be equipped as a repair shop. L. W. Crenger is general manager.

The American Crate & Basket Co., East Forty-seventh Avenue and Clarkson Street, Denver, Colo., contemplates rebuilding the portion of its main plant destroyed by fire Dec. 15, with loss estimated at $150,000, including equipment.

The Board of Education, Virginia, Minn., plans the installation of manual training equipment in its proposed two-story and basement junior high school to cost $750,000 for which bids will be asked soon on a general contract. E. H. Berg, 407 Jones Street, Eveleth, Minn., is architect.

The Heywood Mfg. Co., Fourth Avenue and Third Street, North, Minneapolis, Minn., manufacturer of paper boxes and containers, is reported to be planning an addition to its factory, to cost in excess of $30,000 with equipment. It is expected to begin work in the spring. J. A. Heinrich is secretary and treasurer.

The Central West Public Service Co., Rapid City, S. D., recently organized to take over and consolidate the Platte Valley Power & Light Co., Platte Valley Power Co., and the Dakota Public Service Co., has arranged for a bond issue of $4,000,000, a portion of the fund to be used for carrying out the merger and for proposed expansion. W. N. Albertson is president.

The Sullivan Machinery Co., Chicago, has removed its Butte, Mont., office from 48 East Broadway to 54 East Broadway, in charge of James C. Graham.

C. W. Holmquist, Moline, Ill., has removed his sheet metal shop from 1618 Third Avenue to a new building at 1710 Third Avenue. The new shop has three times the floor space of the former location and represents an investment of $19,000 including equipment.

Cincinnati

CINCINNATI, Dec. 27.

AN appraisal of the business done by local machine tool builders the past year shows that sales averaged approximately 10 to 15 per cent above those in 1925, and in some cases the increase was as high as 30 to 35 per cent. In reviewing conditions in the past 12 months, Cincinnati manufacturers agree that they have enjoyed a year of normal activities with orders well distributed through all the months. In fact, there has been the least fluctuation in sales of any year since 1920. A few executives are of the opinion that bookings in 1926 have been above normal. An analysis of machine tool sales brings out the fact that the automotive industry was one of the best customers the past year, the various subsidiaries of the General Motors Corporation being the largest purchasers. Railroad buying, on the other hand, has been disappointing. The electrical manufacturing industry has bought a good volume of tools, while business from textile manufacturers has been negligible. The greatest source of encouragement has been the increased demand from the general industrial field.

Prospects for the first six months of 1927 are especially good. The number of inquiries now before the trade, and information about some of the developments in the near future are the basis for such optimism. The majority of builders think that local conditions, both from the standpoint of sales and production, will continue through the early part of the coming year at about the same rate that prevailed in 1926.

The Multiple Valve & Mfg. Co., 16 North Canal Street, Dayton, Ohio, has been incorporated with $20,000 capital stock to manufacture high speed valves on which John B. Aufuldish, president, holds basic patents. Operations will begin immediately.

Officials of the Fulton Co., Knoxville, Tenn., manufacturer of valves, regulators, etc., are organizing the Fulton Sylphon Co., to take over and expand the present company. A stock issue to total $3,900,000 will be sold by the new organization to carry out the acquisition. Weston M. Fulton is president.

The Randle Machinery Co., 1723 Powers Street, Cumminsville, Cincinnati, is said to be planning the early purchase of quarry machinery, including crushers, steam shovel, rock drills, air compressors, dump cars and other equipment, primarily for limestone production.

J. Ross Hanahan, 21 Meeting Street, Charleston, S. C., and associates are organizing a company to construct a cement mill in the vicinity of Knoxville, Tenn., where about 300 acres has been secured. The initial plant will be equipped for an output of about 300 bbl. per day and will include

power house, machine shop and other buildings. It is estimated to cost close to $1,500,000 with machinery. Mr. Hanahan will be president.

A merger is being arranged between the Southern Gas & Power Co., Lexington, Ky., with plants and system in Kentucky, North and South Carolina, West Virginia and other states, and the Central Public Utility Service Co., operating in Indiana, Michigan and other Middle West districts. The consolidation will include expansion in present power facilities, with extensions in transmission lines, etc.

Detroit

DETROIT, Dec. 27.

BIDS have been asked on general contract by the New York Bed Spring Co., 638 Brady Avenue, Detroit, for a new two-story plant, 65 x 100 ft., to cost about $70,000 with equipment. I. M. Lewis, Congress Building, is architect.

The August N. Johnson Machine Co., Manistee, Mich., plans the rebuilding of the portion of its plant destroyed by fire Dec. 13, with loss reported at $15,000 with equipment.

The Electric Refrigeration Corporation, Buhl Building, Detroit, comprising a merger of the Kelvinator Co., Nizer Corporation and the Leonard Refrigerator Co., is said to be planning the early purchase of small and large tools and other equipment for its new four-story plant, 440 x 640 ft., in course of construction on the Plymouth Road. The machinery installation will cost close to $600,000, of which more than $200,000 will be used for tools. The entire plant will represent an investment of close to $1,750,000 and is expected to be completed in March. A. H. Goss is president.

Albert Kahn, Marquette Building, Detroit, architect and engineer, has plans for a new multi-story automobile service, repair and garage building, to cose more than $300,000 with equipment.

The Ward Electric Refrigerator Co., 1221 Beaufait Street, Buchanan, Mich., is said to be planning the construction of an addition, to cost in excess of $50,000 with equipment. H. B. Hutchings is secretary and treasurer.

The Hinkley Motors & Parts Corporation, Detroit, is considering the early rebuilding of the portion of its plant at Jackson, Mich., destroyed by fire Dec. 14 with loss reported at close to $200,000 including equipment. The company was known formerly as Hinkley Motors, Inc. C. C. Hinkley is president and general manager.

The Department of Public Works, City Hall, Detroit, John W. Reid, commissioner, is said to be completing plans for its proposed pumping plant for the municipal waterworks, to cost in excess of $850,000 with machinery. Perry A. Fellows is city engineer.

St. Louis

ST. LOUIS, Dec. 27.

THE Southern Ice & Utilities Co., Santa Fe Building, Dallas, Tex., has acquired about 12 acres at Prescott, Ark., and contemplates the construction of a new ice-manufacturing and refrigerating plant, to cost in excess of $150,000 with machinery.

The Essmueller Mill Supply Co., 1220 South Eighth Street, St. Louis, has awarded a general contract to the Hudgens Building Co., Mutual Building, Kansas City, Mo., for a new one-story plant, 50 x 110 ft., at Kansas City, to be used primarily as a machine shop, estimated to cost $30,000. B. H. Essmueller is secretary.

The Arkansas Power & Light Co., Pine Bluff, Ark, is said to be planning the installation of pumping equipment in connection with extensions and improvements in its water supply system at McGee, Ark., to cost $75,000. The company will also make improvements in its power facilities in this section to cost approximately $100,000.

The Kansas City Asphalt Mining & Milling Co., Liberal, Mo., recently organized by W. H. Simpson, and associates, has acquired the local plant of the Liberal Mica Paving & Refining Co., and will operate in the future. Plans are under way for expansion, including the construction of a new mill to cost in excess of $50,000 with equipment.

A. G. Heggem, 303 West Sixth Street, Tulsa, Okla., is at the head of a project to construct and operate a new iron and steel works at Sand Springs, Okla., to cost close to $500,000 with equipment.

The City Council, Kansas City, Kan., is completing plans for the construction of a one-story and basement steam power plant, to cost close to $500,000 with equipment. Arthur T. Mullergren, Gates Building, is engineer.

The Interurban Central Station Co., Scarritt Building, Kansas City, Mo., has plans for a new ten-story automobile service, repair and garage building, 125 x 210 ft., to cost more than $1,000,000. Wight & Wight, First National Bank Building, are architects.

Fire, Dec. 16, destroyed a portion of the gasoline refinery of the McMann Oil Co., Tonkawa, Okla., with loss reported at close to $100,000 including equipment. Plans for rebuilding are under consideration.

The Board of Education, Cozad, Neb., is considering the installation of manual training equipment in a proposed three-story high school, to cost $150,000, for which plans are being prepared by Arthur D. Baker, Clinic Building, Grand Island, Neb., architect.

Pittsburgh

PITTSBURGH, Dec. 27.

NO great activity has marked the last week or ten days of the year. A good many inquiries have been put out or have been obtained by salesmen and the trade will at least start the new year with some business to figure on. The Westinghouse Electric & Mfg. Co. has issued its list for the first quarter of 1927, which includes 87 items.

The Southern Wheel Co., Commonwealth Building, Pittsburgh, Frank C. Turner, vice-president, has awarded a general contract to A. Bentley & Sons, 201 Belmont Avenue, Toledo, Ohio, for its proposed new foundry and plant at Toledo, to cost in excess of $750,000 with equipment. Robert & Co., Bona Allen Building, Atlanta, Ga., are architects and engineers.

The Guyan Machine Shops, Logan, W. Va., machinery dealers, have been inquiring for several 2 and 3-ton electrically-operated hoists.

The Citizens Water Co., Washington, Pa., has disposed of a bond issue of $1,350,000, a portion of the proceeds to be used for extensions and improvements in pumping and power facilities, etc.

The Southern Smokeless Coal Co., care of W. D. Guyer, Moore Building, Charleston, W. Va., recently organized, has acquired the property of the Beury Coal & Coke Co., Beury, W. Va., and is reported to be planning for extensions and improvements, including the installation of power and mining machinery.

The Board of Education, Wilkinsburg, Pa., L. R. Hagan, secretary, contemplates the installation of manual training equipment in its proposed new high school to cost about $500,000. Thomas H. Scott & Son, P. A. Sorg Building, Middletown, Ohio, are architects.

The Standard Sanitary Mfg. Co., Bessemer Building, Pittsburgh, will proceed with the construction of its proposed new factory branch at Altoona, Pa., 195 x 210 ft., estimated to cost close to $150,000 with equipment. D. G. Puderbaugh, Hutchinson Building, Altoona, is architect.

The American Radiator Co., Titusville, Pa., is arranging for resumption of production at its local plant in January. Operations will be devoted to a new model radiator, recently perfected. The plant has been closed since early in November.

The Rainey Tool Co., Grove City, Pa., is planning for the construction of a new building for the manufacture of a combination sled and wagon, recently perfected, with frame of steel, provided with demountable rims and with runners for winter service.

Indiana

INDIANAPOLIS, Dec. 27.

FOLLOWING the recent organization of the Muncie Galvanizing & Mfg. Co., Muncie, Ind., plans are being arranged for the erection of a one-story plant on site formerly used by the Midland Steel Works, to cost in excess of $40,000 with equipment. The new company is headed by C. A. Frick and Karl A. Oesterle, both of Muncie.

The Indiana Limestone Co., Bedford, Ind., is said to be planning to rebuild the portion of its plant at Oolitic, Ind., recently destroyed by fire with loss of about $100,000 including equipment. It was three stories and basement, for general sorting, distributing and loading service. D. H. Johnson is a vice-president.

The Board of School Trustees, Attica, Ind., is considering the installation of manual training equipment in a proposed two-story and basement addition to the high school to cost $175,000, for which bids will be asked on a general contract in February. Johnson, Miller, Miller & Yeager, Terre Haute, Ind., are architects.

Fritch Brothers, Jasper, Ind., have awarded a general contract to A. Berger, Jasper, and the Mesker Steel & Iron Co., Evansville, Ind., for a one-story and basement, 100 x 100 ft., machine shop, service and garage building, to cost about $50,000 with equipment.

The Marshall Electric Co., 3225 Locust Street, St. Louis, has awarded a contract to the Sumner-Sollitt Co., 307 North Michigan Avenue, Chicago, for a one-story branch factory at Elkhart, Ind., to cost about $27,000. Bert C. Hubbard, 53 West Jackson Boulevard, Chicago, is architect.

Buffalo

BUFFALO, Dec. 27.

PLANS have been filed by the Great Lakes Portland Cement Co., 999 Hamburg Turnpike, Buffalo, for additional buildings at its plant now in course of construction, including one-story structure to cost $86,000, one-story coal-handling plant, and one-story pumping plant.

The Fedders Mfg. Co., Inc., 57 Tonawanda Street, Buffalo, manufacturer of automobile radiators, has arranged for a stock issue to total $1,250,000, a portion of the proceeds to be used for expansion. L. F. Fedders is president.

The Rochester Gas & Electric Corporation, Rochester, N. Y., has awarded a general contract to the Austin Co. for a one-story plant for pole service, to be 60 x 120 ft., estimated to cost close to $45,000 with equipment.

Traveling ovens, power equipment, conveying and other machinery will be installed in the three-story and basement plant to be constructed at Syracuse, N. Y., by the Ward Baking Co., 367 Southern Boulevard, New York, for which plans have been filed. It will cost approximately $500,000.

The Niagara, Lockport & Ontario Power Co., Lafayette Building, Buffalo, has disposed of a bond issue of $3,750,000, a portion of the proceeds to be used for extensions and improvements, including transmission lines.

Owing to a confusion of company names it was erroneously stated in a recent issue of THE IRON AGE that the Buffalo Brake Beam Co., 245 Military Road, Buffalo, had awarded a contract for a one-story plant addition, and it was said that this company was formerly known as the Acme Steel & Malleable Iron Works, Inc. The correct information is that the Acme Steel & Malleable Iron Works, Inc., is still in existence and will continue to do business under that name. All of its stock is owned by the Buffalo Brake Beam Co.

The Robeson-Rochester Corporation, Rochester, N. Y., has purchased an 18-acre factory site from the Progressive Foundry Co., also of Rochester, and within the next year will build a new factory for the manufacture of cutlery.

Effective Jan. 1, the Philadelphia office of the Buffalo Forge Co. and the Buffalo Steam Pump Co., in the Land Title Building, will be in charge of W. S. Kolthan and R. W. Pryor, Jr., who for many years have been joint managers of the New York office. They will continue the management of the New York district with an enlarged engineering organization.

Pacific Coast

SAN FRANCISCO, Dec. 22.

CONTRACT has been let by the Pacific Gas & Electric Co., Pacific Gas & Electric Building, San Francisco, to Morrison Brothers, Santa Clara, Cal., for four one-story service, repair and equipment buildings at San Jose, Cal., estimated to cost $70,000 with equipment.

The Board of Education, Riverside, Cal., will install a manual training department in the proposed new school to be erected in the Casa Blanca section, for which plans will be drawn by G. Stanley Wilson, Riverside, architect.

The United States Electric Mfg. Co., 200 East Slauson Street, Los Angeles, has awarded a general contract to the Llewellyn Iron Works, 1200 North Main Street, for a one-story addition, 25 x 85 ft.

The Ford Motor Co., Detroit, engineering department, has plans under way for an assembling plant in the Parr Terminal district, Richmond, Cal., consisting of several buildings totaling about 320,000 sq. ft. of floor space, with power house, reported to cost more than $500,000 with equipment. The entire project will require from 12 to 15 months for completion. The Ford company has awarded a general contract to the Austin Co., Seattle, for a one-story addition to its Seattle assembling plant, 70 x 160 ft., to cost about $35,000.

Curlett & Beelman, Union Bank Building, Los Angeles, architects, have filed plans for a six-story and basement automobile service, repair and garage building, 145 x 155 ft., at 900 South Hill Street, to cost $350,000 with equipment.

Canada

TORONTO, Dec. 27.

MACHINE tools sales in this market have declined the past week partly due to the holiday season. Market conditions, however, are favorable and local dealers and builders report a large volume of prospective business in sight which is expected to develop early next year. Much of the recent demand has been for single tools, but some inquiries include fairly good lists. Several well established manufacturing companies have plans for additions and increased operations for next year. The mining industry of northern Ontario has had a successful year and new companies are announcing proposed mill construction, while established mines are preparing for additions to plant equipment. The pulp and paper industry of Canada has had one of the best years in its history. A number of large mills are contemplated and others are under construction for which equipment has still to be purchased. The iron and steel industry has shared in the better times and mills are running close to capacity, while foundries, agricultural implement firms and railroad equipment builders have been busy throughout the year. Prospects for continued activity are better today than they have been for several years.

The Cockshutt Plow Co., Mohawk Street, Brantford, Ont., has taken out a permit for the erection of a 70 x 70-ft. addition to its foundry. Construction will start immediately and considerable new tools and equipment will be purchased.

The Herbert Morris Crane & Hoist Co., Niagara Falls, Ont., will start work early next year on an addition to its plant. Major John L. Miller is president of the company.

Plans have been completed by Chapman & Oxley, Northern Ontario Building, Toronto, for a $1,000,000 plant to be erected at Fleet and Bathurst Streets, Toronto, for Crosse & Blackwell. Ground will be broken in January.

The factory of the Canadian Canoe Co., Peterborough, Ont., was destroyed by fire with a loss of $100,000. It will probably be rebuilt and will require wood-working tools and general equipment. M. W. Lye is manager.

The city of Amherst, N. S., will install electrical equipment in its waterworks pumping plant to cost $15,000.

Western Canada

The Winnipeg, Man., Power Commission is in the market for three 200 kva. and three 150 kva., 12,000 volt transformers, also for a number of pole type transformers.

The power plant at Nanton, Alta., was recently destroyed by fire with a loss of $20,000. It will be rebuilt.

Foreign

The Superior Railway Council of Spain, Madrid, has plans under consideration for extensions and improvements in the Madrid, Saragossa & Alicante Railroad, including the electrification of several divisions. The entire project will be carried out over several months and is estimated to cost close to $1,235,000.

The Patino Mines & Enterprises Consolidated, 120 Broadway, New York, operating tin properties in Bolivia, is disposing of a capital stock issue of $5,000,000, a portion of the proceeds to be used for expansion. The company also owns and operates the Machacamarca-Uncia Railway. Don Simon I. Patino is president.

An electric power company in Norway is planning the construction of six electric generating stations in Iceland, with total capacity of 900,000 hp. It is understood that work will be started soon. Information at the office of the Bureau of Foreign and Domestic Commerce, Washington, reference Norway No. 227938. The American Consulate, Oslo, Norway, also has data regarding the project.

The New Zealand Government Railways, Wellington, New Zealand, is asking bids until Feb. 14 for electrical equipment, including motor-generator sets, switch-gear, industrial motors, etc., for its new car shops.

The Chapman Valve Mfg. Co., Springfield, Mass., is operating with a force of 1157, the largest number in the history of the organization. A year ago there were 987 on the payroll. The current year will be the greatest in the company's history in the matter of earnings.

The Lowith Iron Works, Inc., 2500-2510 East Twenty-fourth Street, Los Angeles, has increased its capitalization from $50,000 to $250,000. The company plans to increase the volume of its structural steel work.

NEW TRADE PUBLICATIONS

Electrical Measuring Devices.—Leeds & Northrup Co., Philadelphia. Bulletin 840, dealing with temperature control in blast furnace operation. Of particular interest is the temperature contol of hot blast, made possible by the setting of a thermocouple in the main at a point immmediately before it is joined to the bustle pipe. Recording temperature in the down comer and stove is also described.

Foundry Equipment.—Whiting Corporation, Harvey, Ill. Bulletin 181, describing the company's dust filter of the cloth-screen type designed for removing large volumes of dust; bulletin 180, enumerating the chief points of efficiency of the company's latest type of tumbling mill; bulletin 182, explaining the Whiting balanced cupola charger, especially designed to spread iron and coke evenly, and adaptable to both old and new designs of cupolas.

Winter Construction Tools.—Aeroil Burner Co., Inc., 266-270 Hudson Avenue, Union City, N. J. Bulletin 52 cataloging the company's line of concrete heaters, thawing torches, mortar heating pans, salamanders, water heaters, furnace burners and other tools for construction use in cold weather.

Steel Boxes and Platforms.—Truscon Steel Co., Youngstown, Ohio. Catalog 684, describing with illustrations the company's alloy steel boxes, platforms, containers and labor-saving devices, especially designed to speed up production and save space in the factory.

Electric Furnaces.—Automatic & Electric Furnaces, Ltd., London, England. A bulletin, section K, eight pages, describes various types of Wild-Barfield high temperature electric furnaces for the heat treatment of high-speed steel and for general purposes requiring temperatures up to 1400 deg. C.

Spectrographs.—Adam Hilger, Ltd., London, England. A 24-page illustrated pamphlet describes the various types of spectrographs manufactured by this company.

Wavelength Spectrometers.—Adam Hilger, Ltd., London, England. A 21-page pamphlet describes various types of spectrometers which this company puts on the market.

Heat-Treating Equipment.—Stanley P. Rockwell Co., Hartford, Conn. Bulletin No. 2611 is a two-page leaflet giving a comparison of methods of precision heat treatment, the basis of the comparison being results obtained by the Rockwell dilatometer.

Nickel Steel.—International Nickel Co., New York. Bulletin No. 9, "Physical Properties of Nickel and Nickel-Chromium Steels," is a 16-page pamphlet perforated for binding, which contains curves showing the average values of tensile strength, elastic limit, reduction of area, elongation and Brinell hardness at various drawing temperatures for the S.A.E. standard nickel and nickel-chromium steels. Tables of the maximum and minimum values of these same properties reported by various authorities are also given, together with causes of variations and notes on the use of the data in design.

Flow Meters.—Brown Instrument Co., Philadelphia. Leaflet describing an electric flow meter which records the total flow of steam as well as rate of flow on the same chart.

Transformer Tap Changers.—Wagner Electric Corporation, St. Louis. Bulletin 136 dealing with a tap changer for use in large distribution and power transformers which is designed to make it possible to change taps quickly and conveniently in all sorts of weather.

Steel Shelving.—Durand Steel Locker Co., Inc., 33 South Clark Street, Chicago. Illustrated folder devoted to appearance, strength and construction of adjustable steel shelving.

Machinery.—Standard Machinery Co., Auburn, R. I. Illustrated loose leaf catalog containing full descriptions and specifications of the machinery manufactured by the company. Included are presses, drop hammers, rolling mills, swaging machines, draw benches, shears, wire drawing machinery, ball and roller bearings, stock straighteners, turk heads, tumbling barrels and scrap bundlers.

Corrosion.—Quigley Furnace Specialties Co., Inc., 26 Cortlandt Street, New York. Illustrated pamphlet telling of the causes of corrosion and explaining the use of solutions designed to resist it.

THE LAST WORD

(Contributed by the Reader Service Department of the Iron Age Publishing Co.)

NOW proved as an extra-hazardous business risk is the machine tool industry. A table published in *Sales Management*, showing profits and losses in various businesses during 1924, reveals that *more than half the machine tool builders lost money that year.* And there is no reason to regard it as an exceptional year either.

Only 48.1 per cent made a profit. The net earnings for the entire industry were only a little more than 3 million dollars, for the 12 millions made by the profit-makers was offset in a large degree by the 9 millions lost by the others.

Where one made $10,000, *another lost* $7,500.

The fact that the electrical machinery and supplies industry made a net profit of almost 113 millions is not in itself startling, but that against those companies making over 126 millions, the companies in red ink had losses amounting to little over 13 millions, or 10 per cent, is the thing to think about.

'Twas two nights before Christmas. Not a typewriter was stirring when all through the office we searched for a thought to mark in this column the coming of Christmas.

Then in came the postman with a letter from George Tegan, our popular Pittsburgh editor. "Carnegie is displaying a very striking Christmas poster in all its mills and offices. Here is a photograph of it."

"Just what we wanted," we yelled. Though the attractive colors in the original are lost in this small reproduction, still there is sufficient to show that the Carnegie Safety Department, to which all credit for the poster is due, knows how to produce a St. Nick with a personality.

"We know where it starts, but we don't know where it stops," is an expression frequently used by the business manager of a certain industrial publication, which shall be nameless. And just to prove it, a Newark, N. J., attorney-at-law writes, "I am interested in the statistics and business analyses in THE IRON AGE, which I think necessary to an attorney."

Will Mr. Coke and Mr. Blackstone please move over?

Put down the members of the American Foundrymen's Association as hosts extraordinary. Letters from all foreign countries testify to the gracious hospitality the visiting foundrymen received from their American brothers.

"It will remain with me forever as the best trip I have ever had the pleasure of taking," says a British member of the party and a very conservative man, "and I can only thank everyone with whom I came in contact for the very happy time I spent in your country."

Hail the A. F. A. as builders of entente cordiale.

A. H. D.

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